IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

RONALD A. KATZ TECHNOLOGY LICENSING, L.P., Plaintiff, v. TIME WARNER CABLE INC.; TIME WARNER NY CABLE LLC; TIME WARNER ENTERTAINMENT COMPANY, L.P.; AOL LLC; COMPUSERVE INTERACTIVE SERVICES, INC.; NETSCAPE COMMUNICATIONS CORPORATION; UNITED STATES CELLULAR CORPORATION; TDS TELECOMMUNICATIONS CORPORATION; TDS METROCOM, LLC; CABLEVISION SYSTEMS CORPORATION; CSC HOLDINGS, INC.; CABLEVISION SYSTEMS NEW YORK CITY CORPORATION; CABLEVISION OF BROOKHAVEN, INC.; CABLEVISION OF CONNECTICUT CORPORATION; CABLEVISION OF HUDSON COUNTY, INC.; CABLEVISION OF LITCHFIELD, INC.; CABLEVISION OF MONMOUTH, INC.; CABLEVISION OF NEW JERSEY, INC.; CABLEVISION OF OAKLAND, LLC; CABLEVISION OF ROCKLAND/RAMAPO, LLC; CHARTER COMMUNICATIONS, INC.; CHARTER COMMUNICATIONS HOLDING COMPANY, LLC; CHARTER COMMUNICATIONS OPERATING, LLC; CHARTER COMMUNICATIONS ENTERTAINMENT I, LLC; QWEST COMMUNICATIONS INTERNATIONAL INC.; QWEST WIRELESS, L.L.C.; QWEST COMMUNICATIONS CORPORATION; QWEST LD CORP.; QWEST BROADBAND SERVICES, INC.; QWEST INTERPRISE AMERICA, INC., Defendants.	)	C.A. No. _____ **DEMAND FOR JURY TRIAL**

APPENDIX OF PATENTS TO PLAINTIFF RONALD A. KATZ TECHNOLOGY LICENSING, L.P.'S COMPLAINT FOR PATENT INFRINGEMENT

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TABLE OF PATENTS

EXHIBIT 16

US005917893A

United States Patent [19]

Katz

[11] Patent Number: 5,917,893

[45] Date of Patent: *Jun. 29, 1999

[54] **MULTIPLE FORMAT TELEPHONIC INTERFACE CONTROL SYSTEM**

[75] Inventor: **Ronald A. Katz**, Los Angeles, Calif.

[73] Assignee: **Ronald A. Katz Technology Licensing, L.P.**, Beverly Hills, Calif.

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **08/485,113**

[22] Filed: **Jun. 7, 1995**

Related U.S. Application Data

[63] Continuation of application No. 08/306,751, Sep. 14, 1994, which is a continuation of application No. 08/047,241, Apr. 13, 1993, Pat. No. 5,351,285, which is a continuation of application No. 07/509,691, Apr. 16, 1990, abandoned, which is a continuation-in-part of application No. 07/260,104, Oct. 20, 1988, Pat. No. 4,930,150, which is a continuation-in-part of application No. 07/018,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of application No. 06/753,299, Jul. 10, 1985, abandoned, which is a continuation-in-part of application No. 07/640,337, Jan. 11, 1991, abandoned, which is a continuation of application No. 07/335,923, Apr. 10, 1989, which is a continuation of application No. 07/194,258, May 16, 1988, Pat. No. 4,845,739.

[51] **Int. Cl.**[6] **H04M 11/00**

[52] **U.S. Cl.** **379/93.02**; 379/93.12; 379/93.13; 379/92.03

[58] **Field of Search** 379/92, 95, 97, 379/96, 94, 93, 91, 142, 88, 89, 91.01, 91.02, 92.01, 92.03, 93.02, 93.12, 93.13

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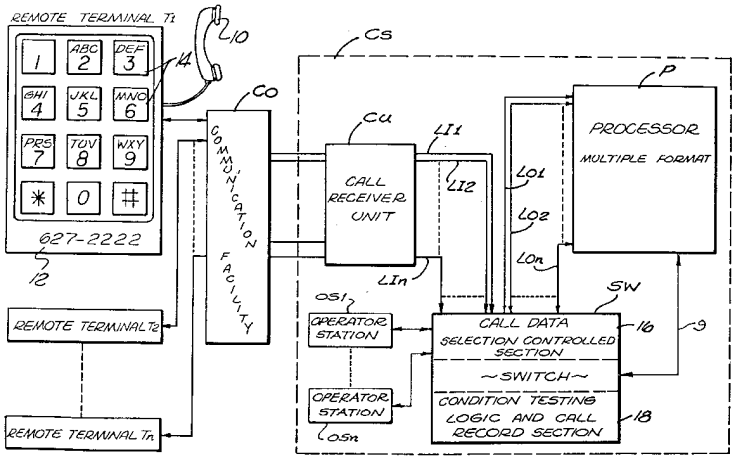
[57] **ABSTRACT**

Call data signals actuated by a telephone terminal are provided from a telephone communication system to indicate call data as the called number, the calling number and the calling equipment. The call data signals address related control functions for selectively interfacing a live operator terminal or a multiple format multiple port data processing system. The interface connection involves providing a specific format as for automated processing or to prompt an operator. Screening tests and format selection are performed to make a determination. Individual telephone terminals and individual data formats are arranged and interfaced under controlled conditions specified by the call data. Time tests, history tests and demographic tests may be executed in addition to basic selection and qualification tests. Control may be executed from active data storage for assembled control words and record words. Record words for individual calls may be stored along with developed data.

89 Claims, 5 Drawing Sheets



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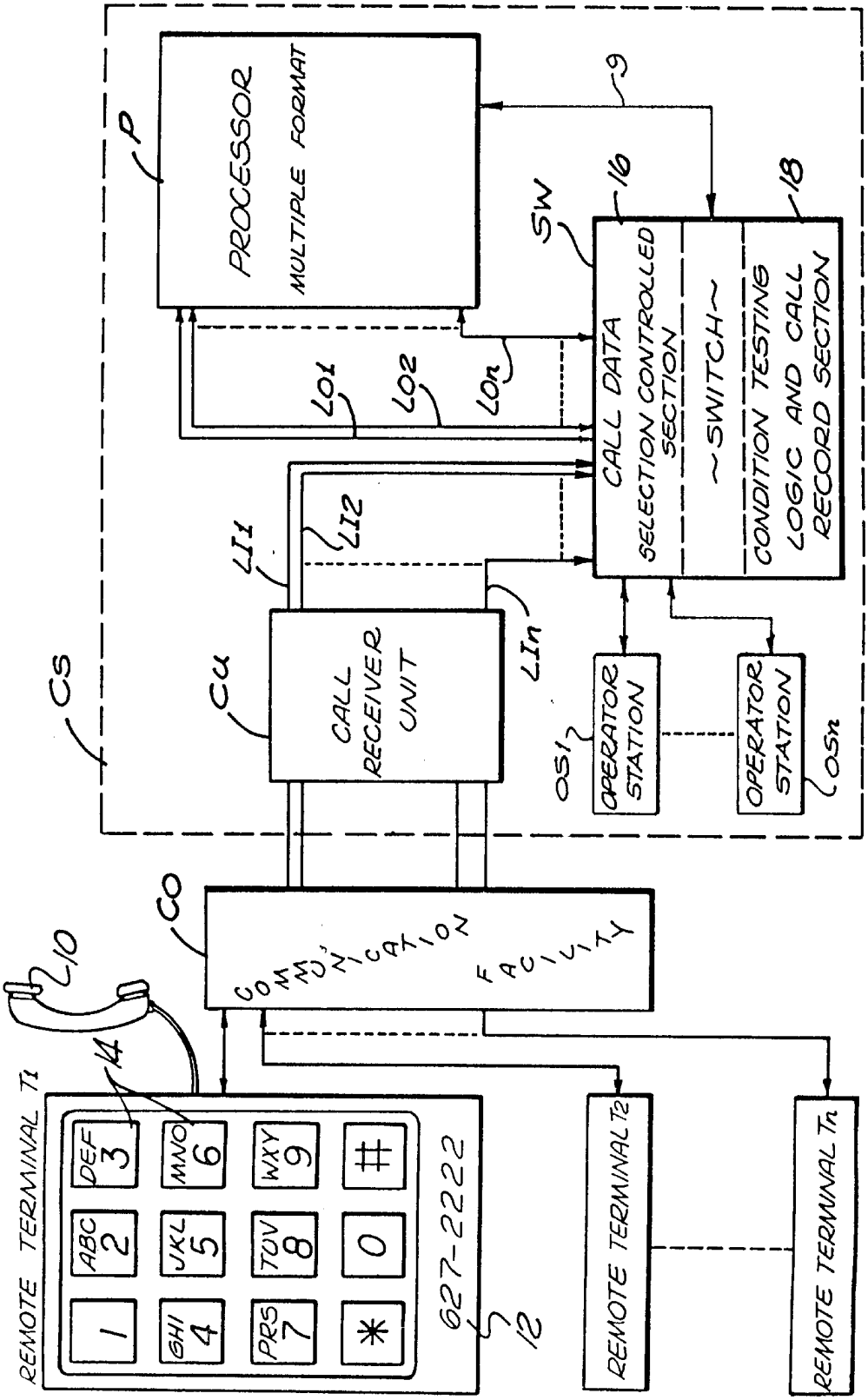
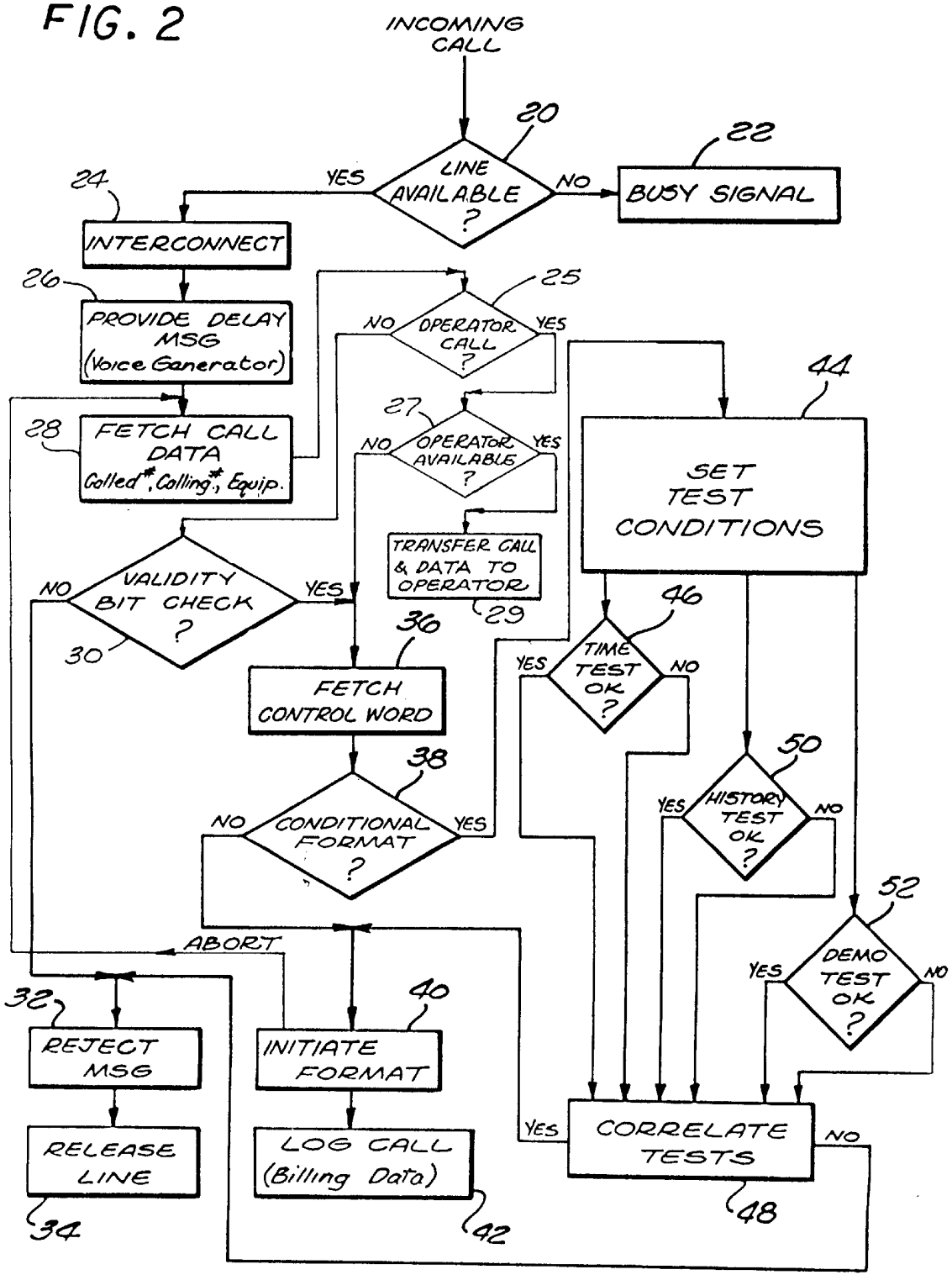

PROCESSOR
MULTIPLE FORMAT
P
9
SW
16
18
CALL DATA
SELECTION CONTROLLED
SECTION
~SWITCH~
CONDITION TESTING
LOGIC AND CALL
RECORD SECTION
Lo1
Lo2
Lon
LI1
LI2
LIn
Cs
Cu
CALL
RECEIVER
UNIT
OS1
OPERATOR
STATION
OPERATOR
STATION
OSn
Co
COMMUNICATION
FACILITY
10
14
REMOTE TERMINAL T1
1
2 ABC
3 DEF
4 GHI
5 JKL
6 MNO
7 PRS
8 TUV
9 WXY
*
0
#
627-2222
12
REMOTE TERMINAL T2
REMOTE TERMINAL Tn

FIG. 1

FIG. 2


INCOMING CALL
20
LINE AVAILABLE ?
YES
NO
22
BUSY SIGNAL
24
INTERCONNECT
26
PROVIDE DELAY MSG (Voice Generator)
25
OPERATOR CALL ?
NO
YES
27
OPERATOR AVAILABLE ?
NO
YES
28
FETCH CALL DATA Called#, Calling#, Equip.
TRANSFER CALL & DATA TO OPERATOR
29
44
SET TEST CONDITIONS
VALIDITY BIT CHECK ?
NO
YES
30
36
FETCH CONTROL WORD
46
TIME TEST OK ?
YES
NO
38
CONDITIONAL FORMAT ?
NO
YES
50
HISTORY TEST OK ?
YES
NO
52
DEMO TEST OK ?
YES
NO
ABORT
32
REJECT MSG
40
INITIATE FORMAT
RELEASE LINE
34
LOG CALL (Billing Data)
42
CORRELATE TESTS
YES
NO
48

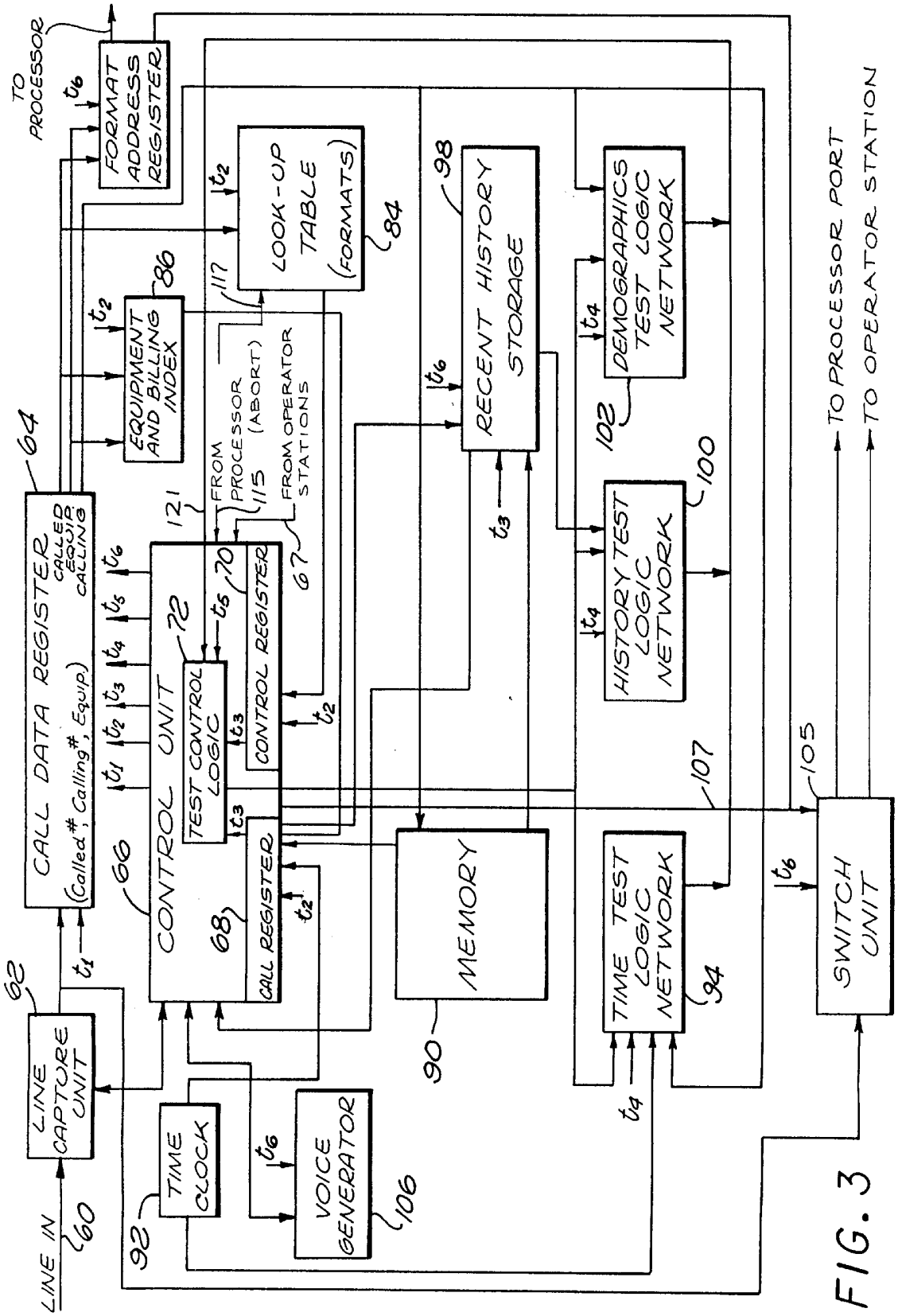

TO PROCESSOR
FORMAT ADDRESS REGISTER
LOOK-UP TABLE (FORMATS)
84
98
RECENT HISTORY STORAGE
DEMOGRAPHICS TEST LOGIC NETWORK
102
EQUIPMENT AND BILLING INDEX
86
117
FROM PROCESSOR (ABORT) 115
FROM OPERATOR STATIONS
67
64
CALL DATA REGISTER
(Called #; Calling #; Equip.)
CALLED EQUIP
CALLING
121
CONTROL UNIT
72
TEST CONTROL LOGIC
CONTROL REGISTER
70
66
68
CALL REGISTER
HISTORY TEST LOGIC NETWORK
100
MEMORY
90
TIME TEST LOGIC NETWORK
94
107
105
TO PROCESSOR PORT
TO OPERATOR STATION
SWITCH UNIT
LINE CAPTURE UNIT
62
LINE IN
60
TIME CLOCK
92
VOICE GENERATOR
106
t1
t2
t3
t4
t5
t6

FIG. 3

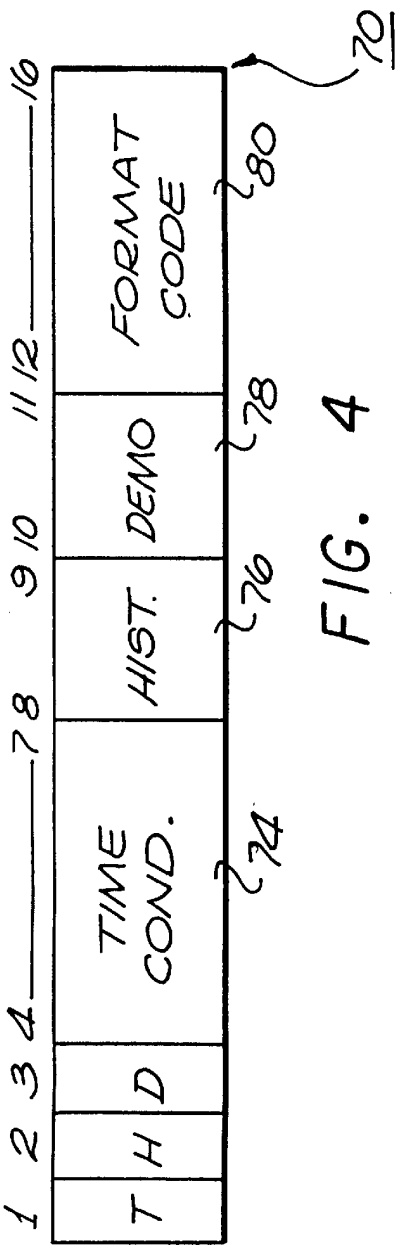

1 2 3 4 7 8 9 10 11 12 16
T
H
D
TIME COND.
HIST.
DEMO
FORMAT CODE
74
76
78
80
70

FIG. 4

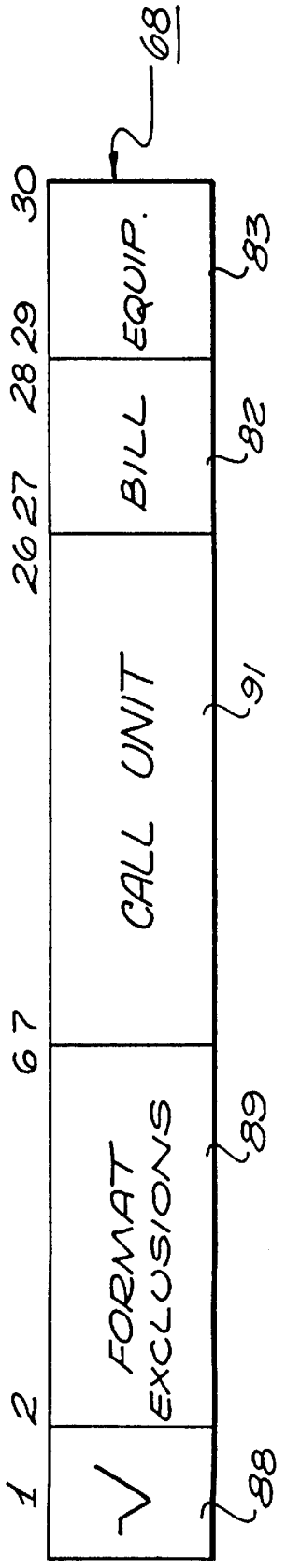

1 2 6 7 26 27 28 29 30
V
FORMAT EXCLUSIONS
CALL UNIT
BILL
EQUIP.
88
89
91
82
83
68

FIG. 5

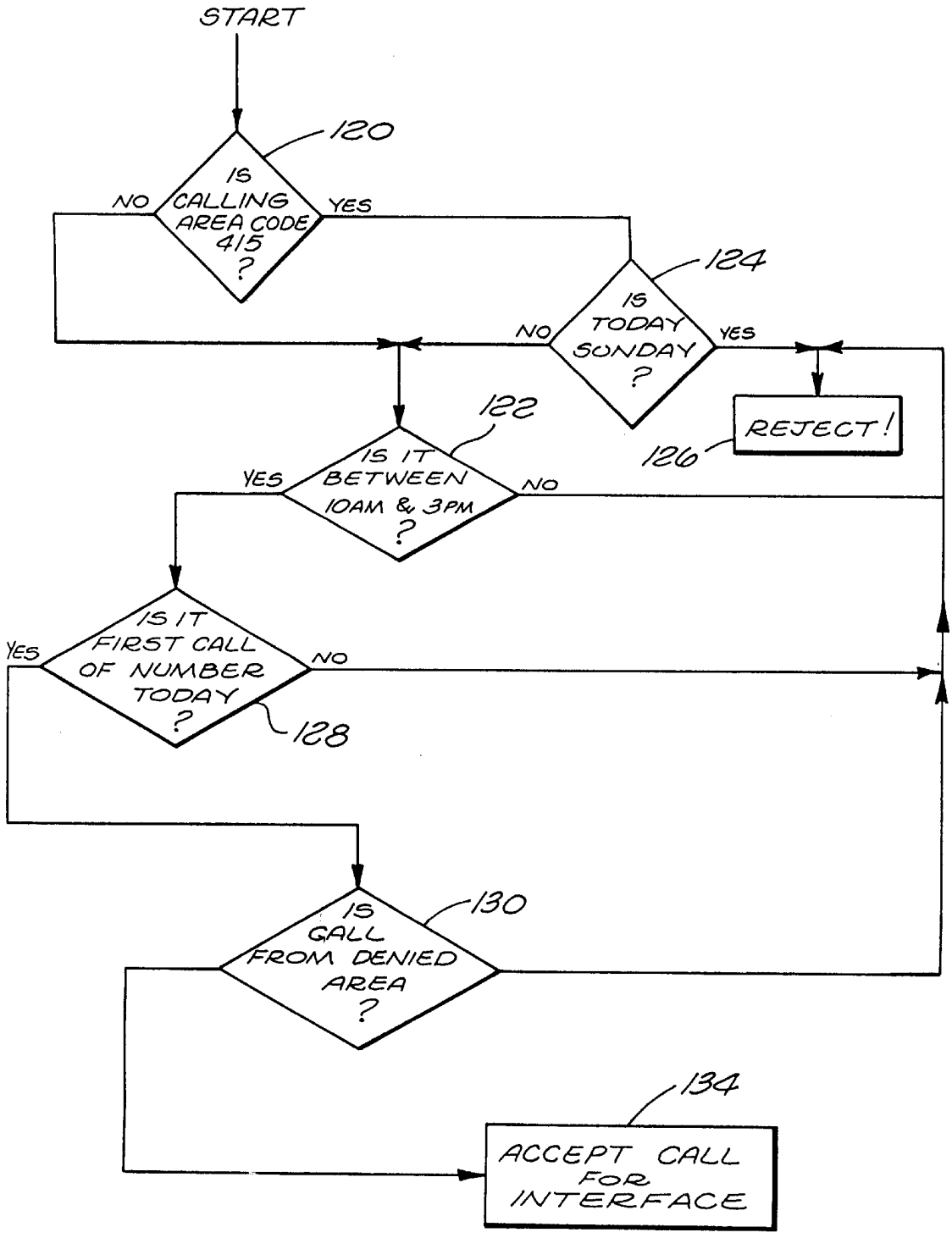

START
120
IS CALLING AREA CODE 415 ?
NO
YES
124
IS TODAY SONDAY ?
NO
YES
REJECT!
126
122
IS IT BETWEEN 10AM & 3PM ?
YES
NO
IS IT FIRST CALL OF NUMBER TODAY ?
YES
NO
128
130
IS CALL FROM DENIED AREA ?
134
ACCEPT CALL FOR INTERFACE

FIG. 6

MULTIPLE FORMAT TELEPHONIC INTERFACE CONTROL SYSTEM

RELATED SUBJECT MATTER

This is a continuation of application Ser. No. 08/306,751, filed Sep. 14, 1994, and entitled "Multiple Format Telephonic Interface Control System", which is a continuation of application Ser. No. 08/047,241 filed Apr. 13, 1993 and entitled "Multiple Format Telephonic Interface Control System", now U.S. Pat. No. 5,351,285, which is a continuation of application Ser. No. 07/509,691 filed Apr. 16, 1990 and entitled "Multiple Format Telephonic Interface Control System", now abandoned, which a continuation-in-part of application Ser. No. 260,104 filed Oct. 20, 1988 and entitled "Telephonic Interface Control System", now U.S. Pat. No. 4,930,150, which is a continuation-in-part of application Ser. No. 018,244 filed Feb. 24, 1987 and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 4,792,968, which was a continuation-in-part of application Ser. No. 753,299 filed Jul. 10, 1985 and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned. Also, this application is a continuation-in-part of application Ser. No. 07/640,337 filed Jan. 11, 1991, and entitled "Telephonic-Interface Statistical Analysis System", now abandoned, which is a continuation of application Ser. No. 07/335,923 filed Apr. 10, 1989, and entitled "Telephonic-Interface Statistical Analysis System", which is a continuation of application Ser. No. 07/194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U.S. Pat. No. 4,845,739, which is a continuation-in-part of application Ser. No. 018,244 filed Feb. 24, 1987 and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 4,792,968, which is a continuation-in-part of application Ser. No. 753,299 filed Jul. 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned.

BACKGROUND AND SUMMARY OF THE INVENTION

Over the past several years, substantial expansion has occurred in the technology of combining telephonic and computer systems. For example, telephone systems have been developed to readily transmit digital data. Various forms of modems are in wide-spread use to intercouple telephones and computers. However, at a more personal level, it also has been proposed to utilize the traditional dialing buttons of telephone instruments to provide digital data, as for various processing. In accordance with such arrangements, voice messages prompt callers to provide data by actuating the alphanumeric buttons of conventional telephones. These systems have been proposed in association with computers to provide various services and one such system is disclosed in U.S. Pat. No. 4,792,968, issued Dec. 20, 1988, to Ronald A. Katz from an application Ser. No. 018,244 filed Feb. 24, 1987.

With respect to telephonic computer systems, attaining the interface format desired by an individual caller is sometimes complex and burdensome. Specifically, callers may be misdirected, screening may be ineffective and delays may be cumbersome. Also, records may be poor or non-existent. Furthermore, some situations exist where interface to a live operator is an important alternative. As a consequence, a need exists for an improved interface system for selectively interfacing a considerable number of individual callers with a multiple format processor, as to attain efficient and economical digital and vocal exchanges along with prompting and data accumulation.

In general, the present invention comprises a telephonic-computer interface system accommodating digital and vocal (analog) telephonic communication and capable of handling a large number of calls to selectively interface prompted live-operator stations or formats in a computer processor. The selected interface is controlled, as by call (called number, calling number, etc.) and can be altered under control of an operator, developed data or operating conditions. Accordingly, the system of the present invention interfaces: (1) a telephonic communication facility including remote terminals for individual callers, e.g. conventional telephone instruments including voice communication means, and digital input means in the form of alphanumeric buttons for providing data and (2) either a prompted live-operator station or a multiple port, multiple format data processor for concurrently processing data from a substantial number of callers with respect to any of several formats.

The interface system incorporates a controller for receiving calls from remote terminals for association with ports in the telephonic computer apparatus, and which receives signal-represented call data (representing "calling" and "called" telephone numbers) along with equipment information. An index apparatus is controlled, as by the signal-represented call data, to select initially a live-operator or machine format of the processor so as to specify any conditions for the interface, at least one of the formats including at least one condition. A test apparatus may determine whether or not an individual call attains specified conditions and thereby controls switching structure for providing the actual interface. If a live-operator terminal is selected, or indicated as a secondary format, prompt data is provided to a select station. Data is recorded and processing procedures also may be controlled by call data.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, an exemplary embodiment exhibiting various objectives and features hereof is set forth, specifically:

FIG. **1** is a block diagram of a system constructed in accordance with the present invention;

FIG. **2** is a flow diagram illustrating the operating process of the system of FIG. **1**;

FIG. **3** is a block diagram of a component portion of the system of FIG. **1**;

FIG. **4** is a diagrammatic representation of a binary control word as registered and utilized in the system of FIG. **1**;

FIG. **5** is a diagrammatic representation of a binary data record word as utilized and recorded in the system of FIG. **1**; and

FIG. **6** is a flow diagram illustrating the operating process of the structure represented in FIG. **5**.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

As required, a detailed illustrative embodiment of the present invention is disclosed herein. However, physical communication systems, data formats, and operating structures in accordance with the present invention may be embodied in a wide variety of forms, some of which may be quite different from those of the disclosed embodiment. Consequently, the specific structural and functional details

disclosed herein are merely representative; yet in that regard, they are deemed to afford the best embodiment for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. **1**, a series of remote terminals T**1**–Tn (telephone instruments) are represented (left). The terminals T**1**–Tn are generally similar and accordingly only the terminal T**1** is shown in any detail. The indicated terminals T**1**–Tn represent the multitude of telephone terminals existing in association with a communication facility CO which may comprise a comprehensive public telephone network.

The communication facility CO, along with the individual terminals T**1**–Tn, is coupled to a central processing station CS generally indicated by a dashed-line block. Generally with regard to the station CS, individual terminals T**1**–Tn are interfaced either with a processor P (upper right) or one of several live-operator stations OS**1**–OSn (lower left) through a call receiver unit CU and a switch SW. Essentially, the processor P and the switch SW cooperate (line **9**) to control interfaces, with the processor P providing interface formats either (or both) to automate an interface or prompt a live operator at a station OS**1**–OSn. Note that the interface formats are stored as described below in the processor P.

In accordance herewith, individual telephone calls are preliminarily processed on the basis of signal-represented call data to identify a specific operating format for a station or the processor P. The preliminary processing may invoke screening tests to impose conditions or establish a test criteria for the switch SW to determine the acceptability of the call to interface with a specific operating format.

Calls are selectively processed according to a specific operating format as indicated by call data. At any instant of time, the collective interface may involve several thousand calls simultaneously being processed through ports of the processor P. Exemplary selected formats of the processor might include: public polls, lotteries, auctions, promotions, sales operations and games. Accordingly, the stations OS**1**–OSn may comprise a substantial number and the processor P may take the form of a sizable computer capable of simultaneously processing many calls involving several different formats. Although numerous possible configurations are available, for purposes of explanation, the processor P is illustrated simply as a block with multiple ports. Note that while the switch SW and the processor P may be integrated in a single system, they are separately illustrated to isolate the detailed structure and process of the present invention.

Input lines LI**1** through LIn from the call receiver unit CU enter the switch SW to provide calling data and communication paths. Output lines LO**1** through LOn function between the switch SW and the processor P as lines LS**1**–LSn operate to serve the stations OS**1**–OSn. Note that various multiplexing techniques are well known in the telephonic art to communicate call data and may be employed in the system.

Considering the system somewhat summarily, individual calls originating at the terminals T**1**–Tn are coupled through the communication facility CO and the call receiver unit CU to the switch SW. Call data, representative of calls, actuates the switch SW to preliminarily process each call based on the desired format. For example, depending on the desired format (indicated by the called number and/or the equipment data signals) calls are selectively coupled and processed. Furthermore, record data is assembled for storage.

Considering the system of FIG. **1** in somewhat greater detail, the exemplary telephone terminal T**1** includes a handpiece **10** (microphone and earphone) and a panel **12** provided with a rectangular array of push buttons **14** in a conventional configuration. Of course, the handpiece **10** accommodates analog signals while the panel **12** is a digital apparatus. Generally, the handpiece **10** serves to manifest analog or voice signals to a caller.

In accordance with conventional telephone structure, alphabetic and numeric designations are provided on the buttons **14**. For example, several of the buttons **14** carry three letters along with a decimal digit. Specifically, the button designated with the numeral "2" also carries the letters "A", "B" and "C". Thus, the buttons **14** encompass the numerals "0–9" two symbols, and the alphabet except for the letters "Q" and "Z". Consequently, the buttons **14** substantially accommodate the entry of decimal and alphabetic data.

At this stage, some specific aspects of the communication facility CO are noteworthy. Essentially, with telephonic dialing, the communication facility CO couples selective terminals (from the multitude of terminals T**1**–Tn) to the call receiver unit CU. In that regard, the unit CU at the central station CS may be reached by any of a plurality of called numbers. For example, the call unit CU might be reached by any of twenty telephone dialing numbers, each associated with a specific operating format of the processor P. One called number or set of numbers might be associated with an auction format of the processor P. Another number or set of numbers might be associated with sales operating formats. Still another called number or set of numbers might identify a game format, and so on.

Incoming calls to the call receiver unit CU are identified by call data in accordance with telephone system techniques. As described below, the call data may specifically include digital signals representative of the called number (DNIS), the calling number (ANI) (terminal number), and the terminal equipment.

In addition to attaining a preliminary interface with a selected format, individual calls may be screened based on the called number (identifying an operating format) and the calling number (caller identification) or the equipment. That is, the system of the present invention is based on a realization that signal-represented call data can be effectively utilized to selectively interface individual callers at remote terminals with specific operating formats of a data processor.

Considering the call data in somewhat greater detail, in accordance with current telephone systems, the communication facility CO may provide signal-represented call data for: the "called" number, the "calling" number, and the equipment involved, e.g. "pulse" or "tone" terminal. Specifically, operating telephone equipment termed "DNIS" automatically provides the called telephone number in digital form from the communication facility CO. Somewhat similarly, existing telephonic equipment designated "ANI" automatically indicates the caller's (calling) number in digital signal represented form. Generally, time shared lines carry such call data and also may provide call data indicating equipment. Thus, the call unit CU may receive the called number, the calling number, and a calling equipment designation (pulse or tone), collectively termed call data, which data is utilized to establish control functions, as for example to select an operating format for a station OS**1**–OSn or the processor P.

As described in detail below, call data is registered in the switch SW to perform distinct control operations. Specifically, a selection section **16** of the switch SW iden-

tifies a specific desired format for the stations OS1–OSn or the processor P. Depending on the format, a testing section **18** of the switch SW may screen calls for interface connections.

Recognizing that the possibilities are great, formats for calls in accordance with the disclosed embodiment may be of three different classes. Specifically, call formats may specify any of the following operations:

1. couple to live operator station if possible or in accordance with a predetermined criteria; if no operator station available, couple to processor;
2. interface to processor;
3. either above format, but selectively re-couple to live operator station or processor depending on secondary conditions.

The ramifications of individual formats within the above classes may vary considerably; however, some examples will illustrate possibilities. A marketing format (class **1**) might interface callers to a live operator if an operator is available. Upon receiving a call, the operator station OS1–OSn (FIG. **1**) also receives and displays prompting format data for the attending operator. If an operator is not available (all stations OS1–OSn busy) the system provides an interface with the processor P and a format as to record the data for a return call by an operator. Alternatively, the processor completes the transaction with data provided by the caller that may be digital, digital and voice, or voice.

In a game format, say of class **2**, a caller may be limited to interface the processor P. the interface may be contingent on initial test conditions, e.g. call data, caller record, time, etc.

Formats of class **3** involve a switch between live operator and processor depending on secondary conditions. For example, a polling format may switch from the processor P to an operator station OS1–OSn if the caller fails to provide digital data in a responsive form. Alternatively, an operator may command a switch to the processor P upon identifying a specific caller from whom data is to be taken.

In the illustrative system of FIG. **1**, an operating process is executed as illustrated in FIG. **2**. Each incoming call prompts a preliminary query as indicated by a block **20** concerning the availability of a line or port. In the absence of an available line, a busy signal is provided as indicated by the block **22**. Alternatively, an available line results in a preliminary interconnect as indicated by a block **24** setting a conditional connection into operation.

As indicated by a block **26**, during the screening or testing interval (typically measured in seconds or fractions of seconds) the caller remains on line and may receive a message. That is, the caller might hear silence or may continue to hear the traditional telephonic ringing sound. Alternatively, the caller might be given a brief vocal message to "stand by" as indicated by the block **26**. In any event, the caller is held "on line" while the process continues.

With a call on a line, the communication facility CO (FIG. **1**) provides signal-represented call data, e.g. the called number, the calling number, and the equipment designation. As indicated by block **28** (FIG. **2**) signals representative of the call data are captured to perform preliminary control and processing operations as will now be considered. Note that the selected formats will fall within one of the classes as stated above.

The initial test is illustrated by a query block **25** representing an operation to distinguish calls of class **1** (operator) and class **2** (processor). Calls for a format seeking an operator prompt a "yes" response from the block **25** and proceed to the test of a block **27**, "is an operator available?" A "yes" determination advances the process to an operation indicated by a block **29**. Specifically , the block **29** represents the operations of coupling a caller to an operator station and transferring the appropriate format data to the station for prompting the operator. If no operator is available (block **27**) the process proceeds with automated control to attain an interface in accordance with an appropriate format. Specifically, a control word is fetched (block **36**) to establish an operating format for interfacing the call. In that regard, the specified format may be very simple. For example, the call simply may be prompted to indicate identification for a return call. Alternatively, the format may incorporate conditions or other complications as explained below.

Returning to the query block **25**, if the call is to be coupled to the processor, an initial test operation is indicated by a block **30**. A validity test is performed, for example, a list of calling numbers may be compiled that are to be denied access to any interface with the processor P. Negative calling numbers may result either by the choice of the person responsible for the calling number terminal, or by the choice of the service operating the processor P (FIG. **1**). For example, an accumulation of prior improper transactions from a terminal designated by a specific telephone number may provide a basis for complete disqualification. Equipment also may disqualify.

Recognizing that various circumstances may be involved with respect to the total disqualification of a calling terminal, in accordance herewith the test involves formulation of a validity bit as indicated by the query block **30**. Acceptable calls set the validity bit at a binary "1".

If the calling terminal is invalid, ("no" from the block **30**) the call is rejected as indicated by the block **32** with or without a message and the line is released as indicated by the block **34**. Note that the time interval involved is very short and the rejection message may take various forms including a verbal comment, a busy signal or simply a disconnected signal.

If a positive validity bit ("1") is formed at the junction of the query block **30**, a control word is fetched under command of the called number as indicated by the block **36**. As described in detail below, a control word is available for each operating format of the processor P and is utilized to impose the conditions for an interface and the terms of any associated billing.

As indicated in FIG. **2**, the fetched control word of the block **36** prompts an inquiry as to the conditions attendant the selected operating format as indicated by a query block **38**. That is, in the process, the query of block **38** determines whether further conditions are imposed for attaining interface with the processor P. If no further conditions are imposed, the format is initiated by pursuing the connected interface as indicated by a block **40**. Also, as indicated by a block **42**, the call is logged or recorded as with respect to billing data for example.

If access to a format involves conditions ("yes" from the query block **38**), tests are specified as illustrated by a block **44**. That is, conditions for the interface are specified by the block **44**. Of course, the specific tests may involve various criteria; however, in the illustrative embodiment, the conditions involve time, history and demographics. Each exemplary condition will now be considered somewhat preliminarily.

In the disclosed embodiment, time tests involve testing the time of the call against certain limitations. For example, it may be desirable to limit some formats to specific time intervals as in relation to a television broadcast, a real time auction and so on. Note that the time tests also may be

related to specific terminal control and geographic areas treated on the basis of telephone area codes. Specific examples will illustrate.

Assume an operating game format that propounds questions to a caller based on knowledge of a particular television program. The program may be broadcast at different times in different geographic areas, and as a consequence it may be desirable to limit calls interfacing the processor format depending on the area code of calling numbers. Accordingly, time tests may involve solely the instant time, or various combinations of time and call data. The specific test is determined as indicated by a block **46** (FIG. **2**) imposing detailed operating instructions for the format. The test results are then correlated as represented by a block **48**.

As indicated above, in accordance with the described embodiment, another test involves a record as for example directed to the station identified by the calling number. As an example, the record might take the form of either a negative or a positive file (for an individual format). In that regard, all formats involving "pay to dial" (e.g. 976, 900 etc.) calls might be conditioned as a group. Generally, in the case of a negative file, certain numbers are recorded that are to be denied access to a particular operating format. In the case of a positive file, access to the operating format is available only to calling numbers listed-in the file.

Considering exemplary implementations of the system, a negative file may be based on limited or restricted use (as in the case of a lottery) or prohibitive use (telephone terminal owner choice). Formats accessible on a "one-time only" basis also may be controlled by negative lists. Thus, an operating format may be inaccessible to a terminal, or may be accessible a specified number of times during a specified interval, e.g. three accesses per week. The historical test is symbolized in FIG. **2** by the query block **50** to conditionally actuate the related tests as indicated in the block **48**. History limitations also may involve purely format limits. For example, a give-away or dial-free format may be limited to some predetermined number of calls for a period, e.g. ten thousand calls per day. Thus, limits can be imposed on the economic exposure of a format.

Moving from the historic considerations, demographic tests may be specified as in relation to the geographic area manifest by the area code of the calling number. To consider a specific example, a public opinion poll may be conducted in which a particular geographic balance is defined. In such an operating format, calls may be accepted only until particular quotas are attained with respect to specified area codes. Such tests in the process are indicated by the query block **52**, again to instruct the correlation block **48**.

With the requisite tests established by selection of a format, the block **48** indicates resolving the acceptability of the call for the selected interface format. If the call is accepted, the process moves to initiate the selected format interface as indicated by the block **40**. Conversely, if the call is to be rejected, the process moves to the step indicated by block **32**, i.e. reject the call as with a message and release the line.

If a call is accepted, as represented by the block **40**, there is a possibility that an established format may be aborted in favor of a different format. For example, interfacing the processor P, a qualified caller may fail to communicate digitally with the result that transfer to a live operator is commanded. Also, in certain situations, a connection to a live operator is to be terminated in favor of an interface to the processor. In either event, an existing format is terminated in favor of a fresh format. That phase of the process is illustrated by an "abort" line from the block **40** returning to the block **28**. Thus, the process returns to re-assign the caller to a new format in accordance with fresh data. Thus, transfers according to class **3** operation are implemented along with the other classes of operation by the switch SW (FIG. **1**).

An exemplary detailed structure of the switch SW (FIG. **1**) for executing the process of FIG. **2** is represented in FIG. **3**. In that regard, individual telephone calls are manifest from the call receiver unit CU (FIG. **1**) comprising existing equipment as well known in the prior art. The call data is supplied through a line **60**, upper left, FIG. **3**. Note that the represented single line **60** is merely symbolic of a channel to carry call data and provide direct telephone communication.

Generally, the system of FIG. **3** illustrates elements of the switch SW of FIG. **1** for processing an individual call. As indicated above, the system of the present invention involves the simultaneous processing of many calls with the possibility that numerous calls are simultaneously being tested for a connection as explained above. Consequently, although the system of FIG. **3** is illustrated with respect to testing a single call, it is to be understood that sequential or parallel operations and multiplexing techniques, as well known and widely practiced in the computer field, are utilized to accomplish multiple processing operations as are described below with reference to FIG. **3**.

The line **60** (FIG. **3**, upper left) enters a line capture unit **62** through which signal-represented call data is supplied to a call data register **64**. Accordingly, the call data is registered to be available for processing operations as explained generally with reference to FIG. **2**.

The line capture unit **62** also is connected to a control unit **66**. Structurally, the control unit **66** may take the form of various computer facilities incorporating memory and logic capability to sequence and control specific functions as explained below. Generally, the control unit **66** implements specific formats which may involve coupling a caller either to a live operator station OS**1**–OSn or to the processor P. In that regard, the control unit **66** provides a series of timing signals t**1**–t**6** to sequence the operations of individual component blocks as illustrated. Note that to preserve clarity in FIG. **1**, connections of timing signals t**1**–t**6** are not illustrated. Also, the control unit **66** is connected to the operator stations OS**1**–OSn (line **67**) to receive signals indicative of the availability of stations.

In addition to logic for controlled switching as described, the control unit **66** specifically includes a call register **68**, a control register **70** and test control logic **72**. The control register **70** receives format control words specified, as by the called number and having a form as illustrated in FIG. **4**.

Recapitulating, each of the operating formats has a control word for defining any access conditions or limitations to accomplish a specific format, e.g. connection to an operator station OS**1**–OSn or to the processor P (FIG. **1**). The formats may vary considerably; however, a few examples are the following:

- Class **1**, connect the live operator if available and provide prompt data for the XYS Company telemarketing program, if operator not available, cue caller: "All operators are busy at the moment, but we will return your call as soon as possible. Please touch your telephone buttons '2' and '4' to identify yourself as twenty-four for the return call".
- Class **2**, couple qualified callers to computer P for polling interface.
- Class **3**, couple callers to computer P for the RST Company telemarketing program, however, transfer to live operator (and prompt) if caller is not responsive.

These formats are established by control words that are selected on the basis of call data. The control words are sixteen bits, illustrated as the first sixteen bits (**1–16**) registered as shown in FIG. **4**. An additional group of registered bits (**17–20**) are provided from call data.

The initial three registered bits in the control register (FIG. **4**) serve as test command bits respectively for a time test, a history test and a demographics test. The presence of a "1" bit in any of the first three bit locations specifies the requirement for testing compliance to specified conditions. A "0" bit indicates no test.

The bits "4 through 7" in the control register constitute a field **74** and specify time conditions in relation to the instant time of the call. The field **74** may specify eight distinct time conditions. For example, exemplary specified conditions for a format might be as follows:

Accept calls between 7:00 and 18:00,

Accept calls on Thursday between 9:00 and 10:00,

Accept calls from area code 213 on Wednesday between 15:00 and 16:00,

Accept calls from area code 602 on Wednesday between 16:00 and 17:00.

Essentially, the time condition field **74** (activated by the time bit "1"—first bit position) defines specific intervals during which calls will be accepted for the specific called number and may be further limited by the area codes. A wide range of possibilities are available to accommodate specific programs for individual formats.

A field **76** in the control register embraces bits "8" and "9" and defines the conditions for access to the format based on historical considerations. Thus, two bits are provided to indicate four possible historical limitations. Again, the test is specified by a "1" bit, in this instance in the second bit location of the register **70**. The following limitations are exemplary of many possibilities as related to a single telephone number:

Accept one call per day (per caller),

Accept one call per week (per caller),

Accept one call per month (per caller),

Accept one call during any three-day period (per caller),

Accept only 10,000 calls (per format).

continuing with respect to the contents of the register **70**, as illustrated in FIG. **4**, bits "10" and "11" constitute a field **78** specifying demographic test limitations. Again, a few examples will illustrate the various possibilities:

Accept calls only from area code 213,

Accept calls from area codes 213, 818 and 619,

Accept only 1,000 calls from area code 213,

Accept calls from area code 213 with the prefix numerals 619.

Again, the demographic test is imposed only upon the existence of a "1" bit, in this instance in the third bit of the control word. As in the other cases, specific possibilities are considerable.

The bits "12" through "16" of the control word constitute a field **80** and designate a selection code for the identified format. These five bits enable a substantial number of formats to be designated and coded with respect to various classifications. For example, calls of the class 1 specifying a desirable connection to a live operator station OS1–OSn might be encoded in a "000" decimal series, e.g. "001" indicates XYZ Company telemarketing program, "034" indicates RST Company program, and so on. Accordingly, a "0" in the most significant digit specifies a live operator format. Similarly, lottery formats might be encoded in a "100" decimal series, e.g. "101, 102, 103- - - 110, 111, 112"- - - and so on; auctions might be designated in a "200" series, e.g.: "201, 202, - - - ". By using decimal equivalent coding formats for various categories, exclusions may be concisely stated. For example, a calling number may be excluded from all lottery operating formats simply by the specification of decimal "100" in association with the calling number.

The data, as illustrated in FIG. **4** is loaded into the control register **70**. Again, the first sixteen bits comprise the format control word and are provided from a look-up table **84** (FIG. **3**, right, central) upon being addressed by call data from the register **64**.

The last bits (bits **17–20**) stored in the control register **70** are provided from an equipment and billing instruction index **86**. That is, in response to the signal-represented call data indicating the called number and the equipment, the look-up table **84** and the index **86** supply data for loading the control register as indicated above.

While the control register **70** is loaded to specify the operation of the system, the call register **68** in the control unit **66** receives signals for additional control and to formulate a record of the call. Specifically, as represented in FIG. **5**, the contents of the call register **68** includes an initial validity bit **88** for indicating that the calling number is either on a positive list or is not on a negative list. The determination of the validity bit for location **88** is made by reference to a memory **90** (FIG. **3**, central) addressed by the calling number.

While the calling number addresses data to indicate a validity bit, specific format exclusions also may be indicated as explained above with respect to certain formats. For example, certain classifications of formats or specific formats (as a lottery) may be identified as inaccessible for certain telephone terminals as identified by calling numbers. Other than lottery formats, certain discretionary formats also may initiate control to limit access. Accordingly, a field **89** in the call register **68** (FIG. **5**, bits "2" through "6") is provided from the memory **90**, addressed by the calling number to specify format exclusions. That is, the calling number addresses the memory **90** to load the field **89** and specify limitations. Consider a few examples of format exclusions or limitations for a calling number:

No lottery formats,

One lottery format per week,

Two lottery formats per month of total cost under $25.00,

No auction sales,

Auction sales only with caller entered code I.D. 763.

Again, it will be apparent that many possibilities exist in applying various coding techniques, the above merely being exemplary. Also, as indicated above, a format may be void of any limitations or restrictions. In that event, as explained above, a connection or interface is promptly commanded by the format code.

The bits "7" through "26" stored in the call register **68** (FIG. **5**) constitute a field **91** and indicate the time of a call. Signals representative of the instant time of a call to load the field **90** are provided from a time clock **92** (FIG. **3**, upper left). Signals from the time clock **92** may be in a Julian code and are provided to the call register **68** and also to a time test logic network **94** (lower left).

The last bits (**27–30**) in the register **68** are provided from the call data. The bits "27" and "28" indicate format billing data and comprise a field **82**. Again, representations are coded; however, with respect to the field **82** information is derived from the called number. For example, an "800"

called number may indicate no billing with the representative code being stored in the field **82**. As another possibility, a "976" prefix number, or "900" number, may indicate a specific charge in relation to the identified format.

The bits "29" and "30" comprise a field **83** and may actuate a special form of the selected format. In the disclosed embodiment, the field **83** registers call data, as to indicate that the calling terminal is a "pulse" (rotary dial) signal unit or a "tone" (touch) signal unit. In the instance of a rotary terminal, the format program may be modified to accommodate "pulse" signal operation or inject operator communication with a transfer to one of the stations OS1–OSn.

Recapitulating to some extent with regard to the composition of the call record word in the register **68** (FIG. **5**), the memory **90** (FIG. **3**) is addressed by calling number data to provide data for the validity bit location **88** and the format-exclusion field **89**. The time of call is stored in the field **91** from the clock **92**. The billing and equipment data are provided by the index **86** in response to "calling" data signals.

Another element of memory, specifically, a recent activity storage **98** (FIG. **3**, lower right) is separately illustrated for convenience of explanation. Essentially, the storage **98** receives words from the call register **63** to maintain a record of interface calls. The recent activity storage may periodically be purged to permanent storage if desired. Thus, the recent activity storage **98** accumulates an activity record of all interface participants with respect to specific formats and is utilized in the history test for determining that an instant calling terminal is within the specified historical limitations as provided from the memory **90**.

The activity tests are performed by a history test logic network **100** (FIG. **3**, lower central). In a related context, the demographics test as explained in detail above is performed by a demographics test logic network **102**. The results of the test logic networks are communicated to the test logic **72** in the control unit **66**. As a consequence, a switch unit **105** is actuated to either operatively couple the line **60** into a port of the processor P (FIG. **1**) or reject the call. If a call is accepted for an interface, a signal is supplied from the test control logic **72** through a line **107** to the switch **105** during the interval of the timing signal T**6**. The signal in the line **107** also is supplied to a format address register **109** for addressing the processor P. The register **109** stores select data signals to address a specific operating format of the processor P.

Recapitulating to some extent, call data indicates an interface format of the processor P (FIG. **1**) with associated limitations, conditions and billing provisions. Call data also indicates possible format limitations or conditions for a calling, number. The system processes the data with respect to the conditions and limitations to selectively enable interface operations. Essentially, the call data specifies a format (processor or operator) and any conditions relating to the format. Representative data accordingly is provided from the look-up table **84** and the memory **90** to the control register **70** and the call register **68** respectfully. Preliminary conditions may or may not be involved; however, qualified calls for an operator involve tests of availability within the control unit **66** according to data received from the stations OS1–OSn (line **67**). As a result, calls are either interfaced to an operator who receives a format prompt, or interfaced to the processor according to a specified format. Thereafter, a shift may command a redetermination and a transfer as described in detail below.

In view of the above structural and logic description of the system of FIG. **3**, the process as described with respect to FIG. **2** and the stored control word forms as described with respect to FIGS. **4** and **5**, a comprehensive understanding of the described embodiment may now best be accomplished by assuming an exemplary call and treating the individual responsive steps. Accordingly, assume the occurrence of a call as manifest on the line **60** (FIG. **3**, upper left). Further, assume that the called number, "976 513 7777" designates a lottery format with limited access. Details of the limited access will be treated below.

Upon occurrence of the call, the line capture unit **62** seizes a line relationship and signals the control unit **66**. Immediately, an interval of time signal t**1** is initiated and the register **64** is loaded with the called number ("900 513 7777"), the calling number ("415 318 4444") and the equipment designation (tone or no tone). To the caller, the operations as now described involve an almost imperceptible delay.

During the following interval of timing signal t**2**, the call register **68** and the control register **70** are loaded as illustrated respectively in FIGS. **4** and **5**. Specifically, the called number and equipment designation specify data to load the control register **70**. The calling number ("415 318 4444") from the register **64**, prompts the memory **90** to load the validity bit **88** and the format exclusions in the field **89** of the register **68**. Concurrently, the time clock **92** loads the field **91** with signals representative of the current time.

If the call register **68** does not receive a validity "1" bit, the calling number is indicated to be barred with a consequence that the line is released by the control unit **66**. In that regard, a voice generator **106** (FIG. **3**, left central) may be actuated by the control unit **66** branching to the operation of timing signal t**6**. Accordingly, a message of denial may be provided on the line **60** prior to release of the line. Note that the voice generator **106** may be variously used to prompt or inform callers in certain preliminary selection operations supplemental to the specific operations disclosed below.

As indicated above, concurrently with the loading of the call register **68** (timing signal t**2**), the control register **70** also is loaded. Specifically, from the register **64**, the called number cues the look-up table **84** to fill most of the control register (bits "1" through "16", FIG. **4**). The fields **82** and **83** are supplied from the index **86**.

That is, distinct from the fields loaded into the control register **70** from the look-up table **84**, the fields **82** and **83** are supplied from the index **86**. In that regard, assume the called number (area code 976) indicates that the charge for the service of the call will be billed through the caller's telephone records. Assume that the field **83** indicates a "tone" terminal effective for a conventional digital interface.

At this point, some still further assumptions will be made to pursue the explanation of the detailed operations. Specifically, assume that the format specified by the called number ("900 513 7777") is a lottery format and includes limitations with respect to time, history and demographics. Accordingly, the initial three bits of the control word all will be "1" bits in the control register **70**.

Assume further that the time conditions specified by the field **74** (FIG. **4**) limit calls from area code 415 to days other than Sunday. Assume that the history field **76** of the control word imposes a limitation of one call per day per calling station. Assume that the demographics field **78** excludes any call from area codes "512 ", "412 ", "812", - - - (not "415"). Finally, assume the selected format (field **80**) designates a specific lottery format, that is lottery "128".

In addition to registration of the data sets detailed above, because a history test is specified, the recent history storage **98** is cued during the interval of timing signal t**3**. The

operation is through the memory **90** by the control unit **66** to prompt the supply of historical data (previously registered record words) for the telephone terminal designated by the calling number ("415 318 4444"). Specifically, during the interval of timing signal t**3**, the storage **98** supplies data on the calling number to the history test logic network **100**. Such data is compiled into a test format as to indicate the number of calls per day, per week, and so on. Note that aggregate call totals may also be supplied as a test criteria. Thus, the control unit **66** coordinates the test criteria data preparatory to the test operations of the individual logic networks **94**, **100** and **102**.

To summarize, in accordance with the above assumptions, the test control logic **72** is set up to coordinate the following specific logic tests:

Time limitation test by network **94**: accept calls from area code 415 except on Sunday,

History limit test by network **100**: accept only one call per day per station,

Demographics test by network **102**: accept no calls from area codes 512, 412, 812 - - - (415 not listed).

As explained above, in addition to the limitations specified, in relation to the format, further limitations may be specified by the calling number. Such limitations are specified by the field **89** in the register **68** (FIGS. **3** and **5**). In the instant example, assume that according to the record word, participation in the lottery format is limited to the interval between 10:00 a.m. and 3:00 p.m., e.g. when minors are in school. The code for such a format is supplied during the interval of timing signal t**3** from the field **89** of the call register **68** to further establish the set-up of the logic **94** acting through the test control logic **72**.

Recapitulating with regard to the test control logic **72**, essentially a program is defined imposing each of the limitations that are specified by the call data in sufficient detail that comparison tests are expediently performed by the networks **94**, **100** and **102**. It is stressed, as indicated above, that the tests are selectively performed only in the event a "1" bit appears in the representative first three bit locations of the control word format. In the illustrative example, all the tests were commanded and accordingly the test control logic **72** sets up the condition for tests to be performed by the networks **94**, **100** and **102**, all during the interval of timing signal t**3**. Of course, the specific example represents one possibility of a substantial number of programs that might be specified to the system.

With the test formats established in the test control logic **72**, the logic networks **94**, **100** and **102** are driven during the interval of test signal t**4** to execute a program in accordance with the assumed example. The process may be variously implemented in logic using well known techniques and is detailed in FIG. **6**. Consider the time test of the network **94**. The time test logic network **94** approves an interface only if: the call is not from area code "415" on a Sunday and furthermore the call occurs between the hours of 10:00 a.m. and 3:00 p.m. As indicated in FIG. **6**, a decision block **120** resolves the area-code "415" time test. If the area code is not "415", the logic proceeds to the next query block **122**. Alternatively, if the area code is "415", the day must be tested against Sunday as indicated by the query block **124**. An affirmative indication from the Sunday test of block **124** prompts a rejection as indicated by the block **126**.

If the Sunday test of block **124** is passed, the program imposes another time test, that is the time-of-day test as indicated by the block **122**. Again, a negative result prompts a rejection; however, a positive result involves the next step as indicated by the block **128**.

Note that the operations designated by query blocks **120**, **122** and **124** are performed by the time test logic network **94** (FIG. **3**). The next test of the block **128** is performed by the history test logic **100**. The block **128** (FIG. **6**) involves a determination of whether or not the instant call is the first for the calling terminal on the instant calendar day. If not, the limitations are exceeded and the call is rejected. If the test is passed, the process next involves the demographic test logic network **102** (FIG. **3**) to determine whether or not the call originated from an excluded area based on the calling number area code.

Area controls are illustrated by the query block **130** of FIG. **6**. Specifically, the demographics test logic network **102** determines whether or not the current call is from a denied area. If so, the call is rejected as indicated by the block **126**. Alternatively, if the area is not excluded, as illustrated by the block **134** in FIG. **6**, the interface is accepted. In the instant case, the area "415" is acceptable.

In the operation of the system as illustrated in FIG. **3**, the logic networks **94**, **100** and **102** indicate test results to the test control logic **72** during the interval of the timing signal t**5**. The logic **72** correlates the test result for action by the control unit **66**. If the imposed conditions are met (or if there are no conditions) the control unit **66** act tates the switch unit **105** and the address register **109** through the line **107** to perfect the interface from the line **60** (upper left) to either a port in the processor P (FIG. **1**) or one of the operator stations OS**1**–OSn. Essentially, the switching operation occurs during the interval of the timing signal t**6**. Concurrently, the address register **109** specifies the select operating format as stored in the processor P for direct use in an interface with a caller, or to be retrieved and supplied through the switch SW to prompt an operator at a station OS**1**–OSn.

Also during the interval of the timing signal t**6**, the contents of the call register **68** is stored in the recent history storage **98**. Note that billing data is stored with the call words and may be selectively extracted from the storage **98**. At the termination of the timing signal t**6**, the interface endures until there is a "disconnect" or an "abort".

If the processor P senses the existence of conditions specifying a shift between a processor interface and a live operator communication, the control unit **66** is actuated as indicated through line **115**. Note that the abort signal is formed either in response to predetermined conditions in an interface with the processor P, or on command from an active operator station. The signal is also supplied to the look-up table **84** which becomes active if a transfer is conditional. That is, if a transfer is conditional, the tests as described above may be invoked. Conversely, if the transfer is unconditional, the control unit **66** simply actuates the switch **105** to make the change and prompts the format address register to establish the desired format or prompt pattern for an operator.

The formats may involve various records, however, in accordance with the system of the present invention affords considerable flexibility to program individual conditions and limitations for each interface format based on the call data (calling number and called number). An interface may involve no conditions or conditions may be imposed from the called number (format selection), the calling number, or both. Accordingly, effective control may be imposed depending upon the service requested as manifest by an individual format, the instant time, the history of use and the demographics involved. The imposed limitations may be non-existent or may involve a relatively complex test pattern as explained in detail above.

In the disclosed embodiment, an effective record of calls is accumulated in the recent history storage **98**. Thus, a composite and detailed record is accumulated of individual calls as executed.

It is to be appreciated that numerous formats may be implemented and controlled utilizing the principles of the system as illustrated above. Accordingly, it is to be understood that the system of the present invention should be interpreted in accordance with the claims as set forth below.

What is claimed is:

1. An interface control system for use with, (1) a communication facility including remote terminals for individual callers to make calls, wherein said remote terminals comprise a telephone capability including voice communication means and some of said remote terminals comprise digital input means for providing data, (2) a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in any one of a plurality of formats, said communication facility automatically providing call data signals, as to indicate called data (DNIS), to select a specific format from said plurality of formats, and (3) a plurality of live operator attended terminals, for a plurality of formats, said interface control system comprising:

call data means for receiving call data signals from said communication facility for a calling remote terminal indicative of calling number identification signals automatically provided by said communication facility and call data signals to indicate called data (DNIS) to select a specific format from said plurality of formats;

interface means for providing automated voice messages relating to said specific format to certain of said individual callers, wherein said certain of said individual callers digitally enter data, including at least caller information data, through said digital input means;

means for directly forwarding, under control of said specific format, a call coupled to said interface means from any one of said remote terminals to one of said plurality of live operator attended terminals for inputting of caller identification data and caller information data when said remote terminals do not have capability to digitally provide data;

qualification means coupled to said live operator attended terminals for controlling access by at least certain of said callers to at least a portion of said system, said qualification being based at least in part on caller identification data entered through said digital input means by at least certain of said callers having digital input means and at said live operator attended terminal when said remote terminals do not have capability to digitally provide data,

means for processing coupled to said live operator attended terminals for processing caller information data entered by an operator at said live operator attended terminal; and

means for storing coupled to said interface means and said processing means for storing certain select data from said caller information data entered by said operator and data entered digitally by said individual callers to update records on said individual callers.

2. An interface control system according to claim **1**, wherein said call data signals automatically provided from said communication facility for a calling remote terminal indicative of calling number identification signals are used to access a positive file of data with respect to said individual callers stored in said means for storing.

3. An interface control system according to claim **2**, wherein said access is subject to a use history test.

4. An interface control system according to claim **1**, wherein said call data signals automatically provided from said communication facility for a calling remote terminal indicative of calling number identification signals are used to access a negative file to test for prohibited use status with respect to individual callers.

5. An interface control system according to claim **1**, wherein said calling number identification signals at least in part control processing of said data entered through said digital input means by said individual callers.

6. An interface control system according to claim **1**, wherein said calling number identification signals are used to test for a limit on use with respect to said individual callers.

7. An interface control system according to claim **6**, wherein said limit on use is a use history test.

8. An interface control system according to claim **7**, wherein said use history test is based on a limited dollar amount.

9. An interface controls system according to claim **7**, wherein said use history test is based on a limited dollar amount for a limited period of time.

10. An interface control system according to claim **7**, wherein said use history test is based on a limited number of accesses.

11. An interface control system according to claim **7**, wherein said use history test is based on a limited number of accesses during a limited period of time.

12. An interface control system according to claim **1**, wherein said qualification means controls access at least in part based upon said call data signals.

13. An interface control system according to claim **12**, wherein said call data signals include said calling number identification signals.

14. An interface control system according to claim **13**, wherein said calling number identification signals include Automatic Number Identification (ANI).

15. An interface control system according to claim **1**, wherein said qualification means controls access at least in part based upon said digitally entered data entered by said caller.

16. An interface control system according to claim **1**, wherein said qualification means controls access at least in part based upon data entered by an operator.

17. An interface control system according to claim **16**, wherein said data entered by a operator is subject to a use history test.

18. An interface control system according to claim **17**, wherein said use history test is based on a limited dollar amount.

19. An interface controls system according to claim **17**, wherein said use history test is based on a limited dollar amount for a limited period of time.

20. An interface control system according to claim **17**, wherein said use history test is based on a limited number of accesses.

21. An interface control system according to claim **17**, wherein said use history test is based on a limited number of accesses during a limited period of time.

22. An interface control system according to claim **1**, wherein said means for storing further receives and stores said calling number identification signals.

23. An interface control system according to claim **22**, wherein said calling number identification signals control at least a part of the operation of the system.

24. An interface control system according to claim **1**, further including means for transferring certain of said calls from said live operators to an automated system to receive processed data via a voice generator.

25. An interface control system according to claim **1**, wherein said qualification means controls access at least in part based upon said digitally entered data entered by said caller when said remote terminals do have capability to digitally provide data and upon said data entered by said operator when said remote terminals do not have capability to digitally provide data.

26. An interface control system according to claim **25**, wherein said qualification means controls access for a predetermined period of time.

27. An interface control system according to claim **25**, further including means for transferring certain of said calls from said line operators to the interface means to receive processed data via a voice generator.

28. An interface control system according to claim **25**, wherein said calling number identification signals control at least in part the processing of data.

29. An interface control system according to claim **28**, wherein said control includes a use history test.

30. An interface control system according to claim **29**, wherein said use history test includes a dollar limit.

31. An interface control system according to claim **29**, wherein said use history test includes a dollar limit and a limit to a predetermined period of time.

32. An interface control system according to claim **1**, wherein said plurality of formats includes a plurality of sales formats.

33. An interface control system for use with, (1) a communication facility including remote terminals for individual callers to make calls, wherein said remote terminals comprise a telephone capability including voice communication means and some of said remote terminals comprise digital input means for providing data, (2) a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in any of a plurality of formats, said communication facility automatically providing call data signals, as to indicate called data (DNIS), to select a specific format from said plurality of formats, and (3) a plurality of live operator attended terminals, for a plurality of formats, said interface control system comprising:

interface means for receiving calling number identification signals and called data (DNIS) signals automatically provided from said communication facility, and for providing automated voice messages relating to a specific format to certain of said individual callers, wherein said certain of said individual callers digitally enter data through said digital input means;

means for directly forwarding a call coupled to said interface means from any one of said remote terminals to one of said plurality of live operator attended terminals under control of said call data signals when said remote terminals do not have capability to digitally provide data;

qualification means coupled to said live operator attended terminals for controlling access by at least certain of said callers to at least a portion of said system, said qualification being based at least in part on caller identification data entered through said digital input means by at least certain of said callers having digital input means and at said live operator attended terminal when said remote terminals do not have capability to digitally provide data,

means for processing coupled to said live operator attended terminals for processing caller information data entered by an operator at said live operator attended terminal; and

means for storing coupled to said interface means and said processing means for storing certain select data from said caller information data entered by said operator and data entered digitally by said individual callers to update records on said individual callers.

34. An interface control system according to claim **33**, wherein said calling number identification signals are used to access a positive file of data relating to said individual callers.

35. An interface control system according to claim **34**, wherein said system further includes a use history test for said individual callers.

36. An interface control system according to claim **35**, wherein said use history test is based on dollar amount.

37. An interface control system according to claim **35**, wherein said use history test is based on number of uses.

38. An interface control system according to claim **33**, wherein said calling number identification signals are used to access a negative file and test for prohibited use status relating to said individual callers.

39. An interface control system according to claim **33**, wherein said calling number identification signals at least in part control processing of said data entered through said digital input means by said certain individual callers.

40. An interface control system according to claim **33**, wherein said calling number identification signals are used to test for a limit on use with respect to said individual callers.

41. An interface control system according to claim **40**, wherein said limit on use is based on time.

42. An interface control system according to claim **40**, wherein said limit on use includes a use history test.

43. An interface control system according to claim **42**, wherein said use history test limits based on dollar amount.

44. An interface control system according to claim **43**, wherein said use history test limits based on a dollar amount for a predetermined period of time.

45. An interface control system according to claim **42**, wherein said use history test limits based on number of uses.

46. An interface control system according to claim **45**, wherein said use history test limits based on a number of uses during a predetermined period of time.

47. An interface control system according to claim **33**, wherein said qualification means controls at least in part based upon said digitally entered data entered by said caller when said remote terminals do have capability to digitally provide data and upon data entered by an operator when said remote terminals do not have the capability to digitally provide data.

48. An interface control system according to claim **33**, wherein said calling number identification signals control at least in part the processing of said data.

49. An interface control system according to claim **33**, wherein said qualification means controls access for a dollar amount for a predetermined period of time.

50. An interface control system according to claim **33**, wherein said plurality of formats includes a plurality of sales formats.

51. An interface control system according to claim **33**, wherein said qualification means controls access at least in part based upon said call data signals.

52. An interface control system according to claim **51**, wherein said call data signals include said calling number identification signals.

53. An interface control system according to claim 52, wherein said calling number identification signals include Automatic Number Identification (ANI).

54. An interface control system according to claim 33, wherein said qualification means controls access at least in part based upon said digitally entered data entered by said caller.

55. An interface control system according to claim 33, wherein said qualification means controls access at least in part based upon data entered by an operator.

56. An interface control system according to claim 33, wherein said means for storing stores said calling number identification signals.

57. An interface control system according to claim 33, wherein said calling number identification signals control at least a part of the operation of the system.

58. An interface control system according to claim 33, further including means for transferring certain of said calls from said live operators to the interface means to receive processed data via a voice generator.

59. An interface and process control system of a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in one of a plurality of formats for use with a telephonic communication facility including remote terminals for individual callers, wherein said remote terminals comprise a telephone capability including voice communication means and digital input means for providing data, said interface and process control system comprising:

call data means for receiving signal-represented call data from said remote terminals indicative of called number identification signals (DNIS) automatically provided by said telephonic communication facility;

selection means coupled to said call data means for selecting a select data format from said plurality of formats under control of said signal-represented call data indicative of called DNIS, said select data format having an imposed condition to execute certain operations of said select data format, one of said formats having an imposed condition for verifying an instant call from a remote terminal against a file to limit or prevent access in accordance with said DNIS signals to said one format from callers listed on said file and at least one of said plurality of formats having an imposed condition with respect to time in accordance with said DNIS signals;

test means coupled to said selection means for testing said imposed condition to provide approval signals; and

processing means coupled to said test means for executing certain operations of said select format under control of said approval signals.

60. An interface control system according to claim 59, wherein said file is a negative file and wherein said call data means also receives calling number identification signals automatically provided by said telephonic communication facility, which are used to access said file.

61. An interface control system according to claim 60, wherein said negative file limits access based on a use history test.

62. An interface control system according to claim 61, wherein said use history test is a dollar test.

63. An interface control system according to claim 62, wherein said use history test is a dollar test for a predetermined period of time.

64. An interface control system according to claim 61, wherein said use history test is based on the number of accesses.

65. An interface control system according to claim 64, wherein said use history test is based on the number of accesses for a predetermined period of time.

66. An interface and process control system according to claim 59, wherein said processing means performs certain preliminary processing operations before testing of said imposed condition.

67. An interface control system according to claim 59, wherein said plurality of formats includes a plurality of sales formats.

68. An interface control system for use with, (1) a communication facility including remote terminals for individual callers to make calls, wherein said remote terminals comprise a telephonic instrument including voice communication means and some of said remote terminals comprise digital input means for providing data, and (2) a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in any of a plurality of formats, said communication facility automatically providing call data signals, as to indicate called data (DNIS), to select a particular format from said plurality of formats, and (3) a plurality of live operator attended terminals, for a plurality of formats, said interface control system comprising:

call data means for receiving signal-represented call data from said remote terminals indicative of called number identification signals (DNIS) automatically provided by said telephonic communication facility;

interface means for providing automated voice messages relating to a specific format to certain of said individual callers, wherein said certain of said individual callers digitally enter data through said digital input means;

means for directly forwarding certain of said calls coupled to said interface means from any one of said remote terminals to one of said plurality of live operator attended terminals under control of said call data signals when necessary;

qualification means for controlling access by at least certain of said callers to at least a portion of said system,

means for processing coupled to said live operator attended terminals for processing caller information data entered by an operator at said live operator attended terminal; and

means for transferring certain of said calls from said live operators to said interface means to receive processed data via a voice generator.

69. An interface control system according to claim 68, wherein said call data means further receives calling number identification signals automatically provided by said telephonic communication facility.

70. An interface control system according to claim 69, wherein said means for processing controls processing of said caller information data based at least in part on said calling number identification signals.

71. An interface control system according to claim 69, wherein said qualification means operates at least in part on said calling number identification signals.

72. An interface control system according to claim 71, wherein said system further includes a use history test for said individual callers.

73. An interface control system according to claim 72, wherein said use history test is based on dollar amount.

74. An interface control system according to claim 72, wherein said use history test is based on number of uses.

75. An interface control system according to claim 74, wherein said use history test is based on the number of accesses for a predetermined period of time.

76. An interface control system according to claim **68**, wherein said means for processing also processes said data entered by said certain of said individual callers through said digital input means to control certain operations based on a limit on use.

77. An interface control system according to claim **76**, wherein said system further includes a use history test for said individual callers.

78. An interface control system according to claim **77**, wherein said use history test is based on dollar amount.

79. An interface control system according to claim **78**, wherein said use history test is a dollar test for a predetermined period of time.

80. An interface control system according to claim **77**, wherein said use history test is based on number of uses.

81. An interface control system according to claim **80**, wherein said use history test is based on a number of uses for a predetermined period of time.

82. An interface control system according to claim **68**, wherein said plurality of formats includes a plurality of sales formats.

83. An interface control system according to claim **68**, wherein said qualification means controls access at least in part based upon said call data signals.

84. An interface control system according to claim **83**, wherein said call data signals include said calling number identification signals.

85. An interface control system according to claim **84**, wherein said calling number identification signals include Automatic Number Identification (ANI).

86. An interface control system according to claim **68**, wherein said qualification means controls access at least in part based upon said digitally entered data entered by said caller.

87. An interface control system according to claim **68**, wherein said qualification means controls access at least in part based upon data entered by an operator.

88. An interface control system according to claim **68**, wherein said means for storing stores said calling number identification signals.

89. An interface control system according to claim **88**, wherein said calling number identification signals control at least a part of the operation of the system.

* * * * *

EXHIBIT 17

US005974120A

United States Patent [19]

Katz

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[45] Date of Patent: *Oct. 26, 1999

[54] **TELEPHONE INTERFACE CALL PROCESSING SYSTEM WITH CALL SELECTIVITY**

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[73] Assignee: **Ronald A. Katz Technology Licensing, L.P.**, Los Angeles, Calif.

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **08/480,185**

[22] Filed: **Jun. 7, 1995**

Related U.S. Application Data

[63] Continuation of application No. 08/132,062, Oct. 4, 1993, Pat. No. 5,828,734, which is a continuation of application No. 07/779,762, Oct. 21, 1991, Pat. No. 5,251,252, which is a continuation of application No. 07/425,779, Oct. 23, 1989, Pat. No. 5,128,984, which is a continuation-in-part of application No. 07/312,792, Feb. 21, 1989, Pat. No. 5,073,929, which is a continuation-in-part of application No. 07/194,258, May 16, 1988, Pat. No. 4,845,739, which is a continuation-in-part of application No. 07/018,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of application No. 06/753,299, Jul. 10, 1985, abandoned, said application No. 08/132,062, is a continuation-in-part of application No. 08/306,751, Sep. 14, 1994, which is a continuation of application No. 08/047,241, Apr. 13, 1993, Pat. No. 5,351,285, which is a continuation of application No. 07/509,691, Apr. 16, 1990, abandoned, and a continuation-in-part of application No. 07/640,337, Jan. 11, 1991, which is a continuation of application No. 07/335,923, Apr. 10, 1989, which is a continuation of application No. 07/194,258, May 16, 1988, Pat. No. 4,845,739, which is a continuation-in-part of application No. 07/018,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of application No. 06/753,299, Jul. 10, 1985, abandoned, said application No. 07/509,691, is a continuation-in-part of application No. 07/260,104, Oct. 20, 1988, Pat. No. 4,930,150, which is a continuation-in-part of application No. 07/018,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of application No. 06/753,299, Jul. 10, 1985, abandoned.

[51] **Int. Cl.**[6] **H04M 11/00**

[52] **U.S. Cl.** **379/93.13**; 379/93.12; 379/93.02

[58] **Field of Search** 379/92, 97, 142, 379/95, 207, 225, 127, 201, 211, 266, 265, 91, 93.13, 93.12, 91.01, 91.02, 92.01, 92.03, 93.02, 93.14, 88.16, 88.2

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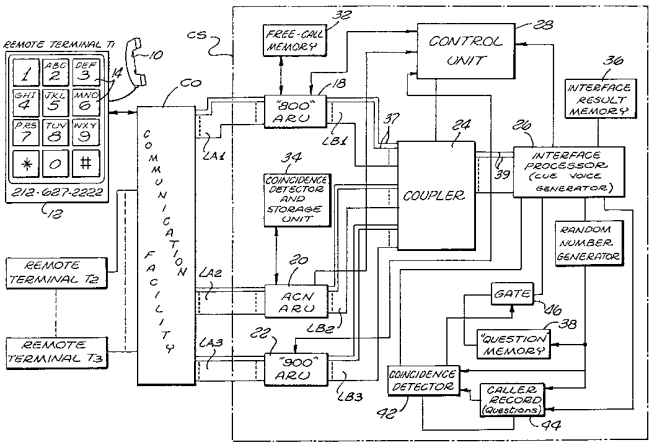
(List continued on next page.)

Primary Examiner—Stella Woo
Attorney, Agent, or Firm—Lyon & Lyon LLP

[57] **ABSTRACT**

For use with a public telephone network CO incorporating a vast number of terminals Tl–Tn, a system CS limits and controls interface access to implement voice-digital communication for statistical processing. The system CS accommodates calls in different modes; e.g. "800", "900" or area code and incorporates qualifying apparatus to restrict against caller misuse. Alternative calling modes are used to reach an interface facility that also affords some control based on calling terminal identification, e.g. as by ANI equipment.

81 Claims, 2 Drawing Sheets



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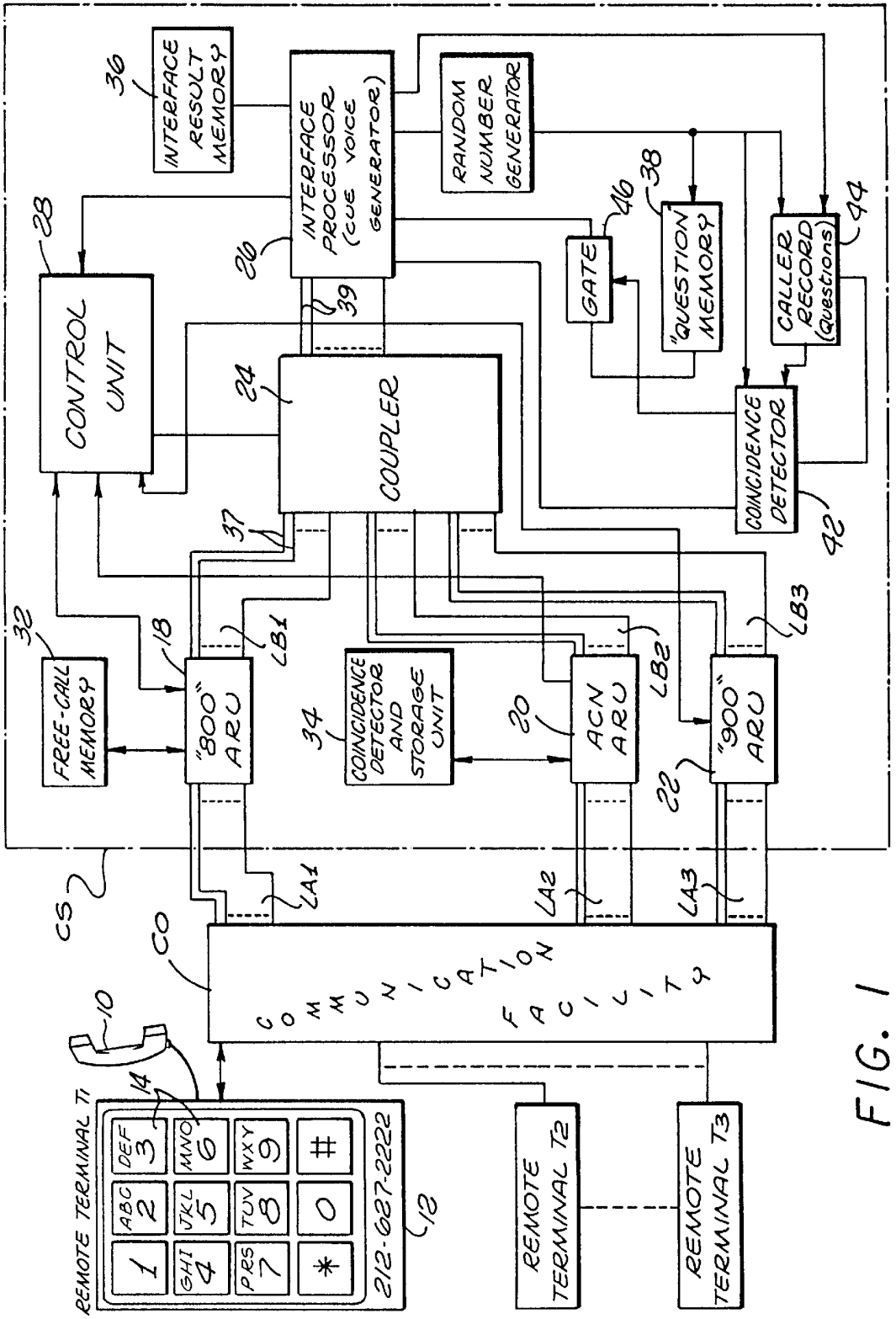
INTERFACE RESULT MEMORY
INTERFACE PROCESSOR (CUE VOICE GENERATOR)
RANDOM NUMBER GENERATOR
CONTROL UNIT
COUPLER
GATE
"QUESTION MEMORY
CALLER RECORD (Questions)
COINCIDENCE DETECTOR
FREE-CALL MEMORY
"800" ARU
COINCIDENCE DETECTOR AND STORAGE UNIT
ACN ARU
"900" ARU
COMMUNICATION FACILITY
REMOTE TERMINAL T1
REMOTE TERMINAL T2
REMOTE TERMINAL T3
212-627-2222

FIG. 1

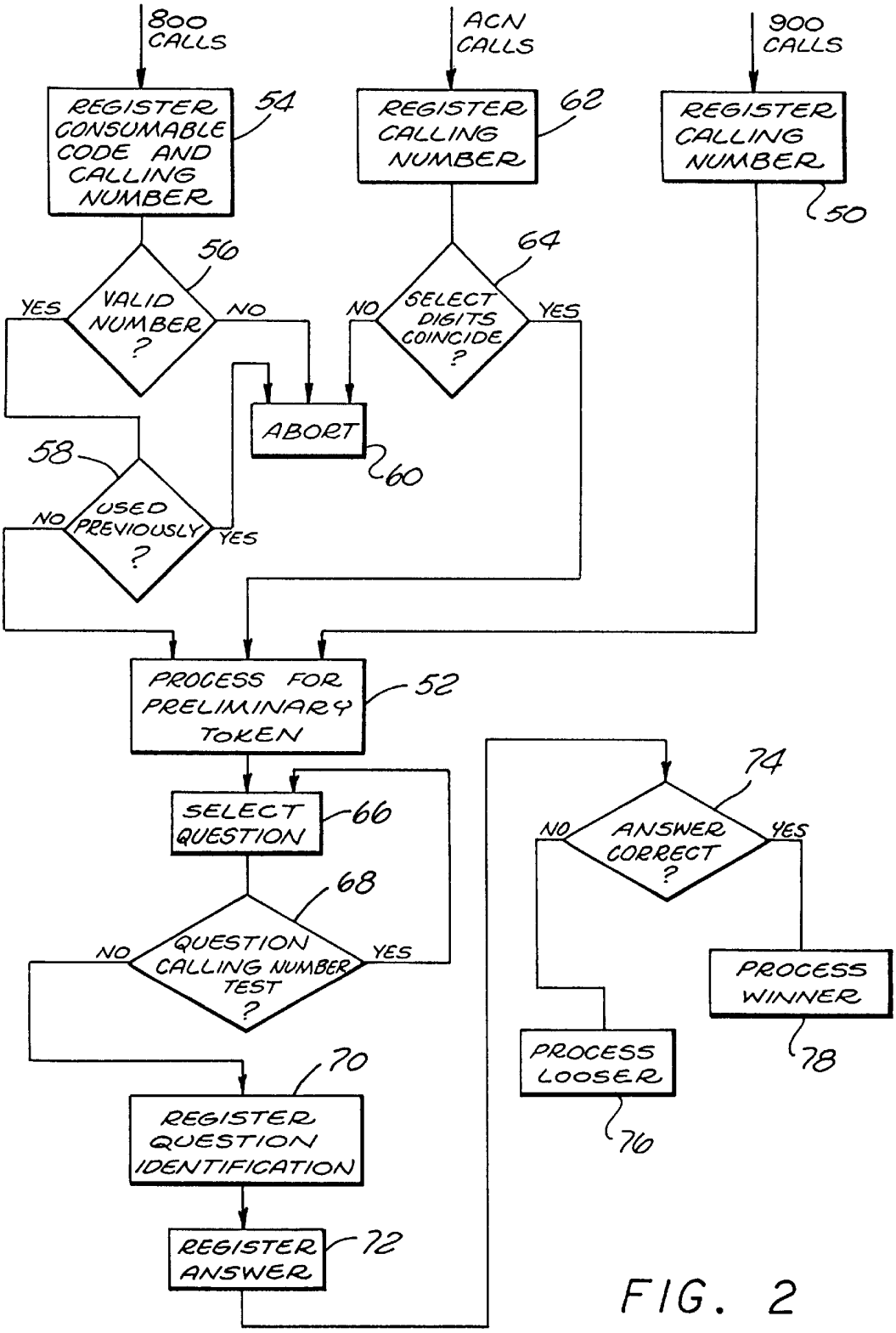
800 CALLS
ACN CALLS
900 CALLS
REGISTER CONSUMABLE CODE AND CALLING NUMBER
54
REGISTER CALLING NUMBER
62
REGISTER CALLING NUMBER
50
56
VALID NUMBER ?
YES
NO
64
SELECT DIGITS COINCIDE ?
NO
YES
ABORT
60
58
USED PREVIOUSLY ?
NO
YES
PROCESS FOR PRELIMINARY TOKEN
52
SELECT QUESTION
66
68
QUESTION CALLING NUMBER TEST ?
NO
YES
70
REGISTER QUESTION IDENTIFICATION
REGISTER ANSWER
72
74
ANSWER CORRECT ?
NO
YES
PROCESS WINNER
78
PROCESS LOOSER
76

FIG. 2

TELEPHONE INTERFACE CALL PROCESSING SYSTEM WITH CALL SELECTIVITY

RELATED SUBJECT MATTER

This is a continuation of application Ser. No. 08/132,062, filed Oct. 4, 1993, and entitled "Telephone Interface Call Processing System With Call Selectivity", now U.S. Pat. No. 5,828,734, which is a continuation of application Ser. No. 07/779,762, filed Oct. 21, 1991, and entitled "Telephone Interface Call Processing System With Call Selectivity", now U.S. Pat. No. 5,251,252, which is a continuation of application Ser. No. 07/425,779, filed on Oct. 23, 1989, and entitled "Telephone Interface Call Processing System With Call Selectivity", now U.S. Pat. No. 5,128,984, which is continuation-in-part of application Ser. No. 312,792 filed Feb. 21, 1989, and entitled "Voice-Data Telephonic Control System" now U.S. Pat. No. 5,073,929, which is a continuation-in-part of application Ser. No. 07/194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U.S. Pat. No. 4,845,739, which is a continuation-in-part of Application Ser. No. 07/018,244 filed Feb. 24, 1987, and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 4,792,968, which is a continuation-in-part of application Ser. No. 06/753,299 filed Jul. 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned. Also, said application Ser. No. 08/132,062 is a continuation-in-part of application Ser. No. 08/306,751, filed Sep. 14, 1994, and entitled "Multiple Format Telephonic Interface Control System", which is a continuation of application Ser. No. 08/047,241, filed Apr. 13, 1993, and entitled "Multiple Format Telephonic Interface Control System", now U.S. Pat. No. 5,351,285, which is a continuation of application Ser. No. 07/509,691, filed Apr. 16, 1990, now abandoned and a continuation-in-part of application Ser. No. 07/640,337, filed Jan. 11, 1991, and entitled "Telephonic-Interface Statistical Analysis System", which is a continuation of application Ser. No. 07/335,923, filed Apr. 10, 1989, which is a continuation of application Ser. No. 07/194,258, filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U.S. Pat. No. 4,845,739, which is a continuation-in-part of application Ser. No. 07/018,244, filed Feb. 24, 1987, and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 4,792,968, which is a continuation-in-part of application Ser. No. 06/753,299, filed Jul. 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned, said application Ser. No. 07/509,691, is a continuation-in-part of Ser. No. 07/260,104, filed Oct. 20, 1988, and entitled "Telephonic Interface Control System", now U.S. Pat. No. 4,930,150, which is a continuation-in-part of application Ser. No. 07/018,244, filed Feb. 24, 1987, and entitled "Statistical Analysis System for Use with Public Communication Facility", now U.S. Pat. No. 4,792,968, which is a continuation-in-part of application Ser. No. 06/753,299, filed Jul. 10, 1985, now abandoned.

BACKGROUND AND SUMMARY OF THE INVENTION

Recent years have seen a considerable growth in the use of telephonic communications. For example, in various applications, telecommunications applications have expanded to accommodate voice-digital interfaces between computer apparatus and callers at remote telephone terminals. For example, by actuating the push buttons at a remote telephone terminal, a caller controls a computer apparatus to provide various entertainment or information. In using such a system, a caller might telephone a financial service and selectively actuate the telephone key panel to receive information on specific stocks or bonds.

Digital interface systems also have been implemented to utilize digital signals provided independently of the caller's actions. For example, the so-called "ANI" telephone equipment provides digital signals indicating a caller's telephone number. Equipment designated "DNIS" is similarly available to indicate the called number. Thus, digital signals may be provided telephonically to a system associated with individual calling terminals as for identification or other use.

Telephonic games and contests are among the various applications that have been recognized for implementation with telephone interface systems. Such games and contests may be variously presented, as in cooperation with an advertising program for a product or in a lottery format. Generally with respect to such applications, various call modes might be utilized.

Essentially, three telephonic calling modes or services are in widespread use. Specifically, caller-charge or "900" service (including "976" calls) involves a charge to the caller for each call. The "900" calling mode is useful for implementing games and contests with telephone interface systems; however, certain problems are encountered. Specifically, certain telephone terminals, e.g. pay phones, do not accommodate "900" service. Also, with respect to certain forms of games and contests, it is important to offer members of the public an alternative "free" method of participation. In general, the system of the present invention may be employed to implement "900" calling modes while accommodating "free" participation with reasonable control.

Telephone calls may be accommodated without charge using "800" service or calling mode. Generally, the "800" calling mode accommodates free calls by callers in various areas to a particular station incurring the charges. In most applications, it is important to regulate the use of the "800" calling mode. Another calling mode is the traditional method of calling, involving area-code numbers which also includes calls placed within a given area code which do not usually involve a specific charge and usually do not require dialing the area code. One of the problems associated with using the area-code calling mode for interface systems is the vast number of calls. For example, even in association with an advertising campaign, inviting members of the general public to participate in a free contest or game by telephone may prompt an overwhelming response. Accordingly, a need exists for a practical system to control and limit calls to an interface service in the traditional free area-code number mode.

Another aspect of telephonic-interface contests involves zealous or obsessive participants. For example, in a quiz contest, a zealous person might call repeatedly, researching answers to given questions until ultimately a question is repeated. At that time, the caller is ready with an answer and has an unfair advantage in the contest. Thus, a need exists for control within the interface system.

In general, the system of the present invention involves a telephone call processing system for receiving calls from a multitude of terminals in different call modes and for processing calls, as to a game or contest format, with means to limit repeat-call advantages. In a disclosed form, the system implements three calling modes to facilitate various formats

while accomplishing certain protection both with regard to the calling mode and contest formats.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, exemplary embodiments exhibiting various objectives and features hereof are set forth, specifically:

FIG. **1** is a block diagram of a system constructed in accordance with the present invention; and

FIG. **2** is a flow diagram of an operating format of the system of FIG. **1**.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

As required, a-detailed illustrative embodiment of the present invention is disclosed herein. However, telephone techniques, physical communication systems, data formats and operating structures in accordance with the present invention may be embodied in a wide variety of forms and modes, some of which may be quite different from those of the disclosed embodiment. Consequently, the specific structural and functional details disclosed herein are merely representative, yet in that regard, they are deemed to afford the best embodiment for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. **1**, a series of remote terminals T**1**–TN (telephone instruments) are represented (left). The terminals T**1**–TN may be functionally similar and accordingly only the terminal T**1** is shown in any detail. The indicated terminals T**1**–TN represent the multitude of telephone terminals existing in association with a communication facility CO which may comprise a comprehensive public telephone network.

The communication facility CO, accommodating the individual terminals T**1**–TN, is coupled to a central processing station CS generally indicated within a dashed-line block. In the station CS, to illustrate operating aspects of the present invention, calls are selectively accepted and interfaced so as to accomplish a desired operating format, for example a contest or game.

Generally, calls from the individual terminals T**1**–TN might be in any of three modes, i.e. the "800" mode, the "900" mode or the area-code mode (traditional area code plus number or local number dialing). In the disclosed illustrative system, depending on individual calling modes, calls are selectively accepted for interface processing. Generally, the interface format accommodates "900" calls with supplemental "800" calls to accommodate both "free" access and all types of telephone terminals. In the disclosed embodiment, calls in the "800" mode are restricted in accordance with prearranged limitations. Furthermore, calls in the area-code mode (from all areas), the 800 mode and 900 mode may be limited to callers having a station number containing a predetermined digit sequence. For example, calls might be restricted to those from terminals having a telephone number ending in the digits "234".

The processing station CS also is controlled to limit the effectiveness of zealous callers. For example, in a contest formats callers may be quizzed with questions randomly drawn from an inventory. In accordance herewith, questions are not repeated to individual telephone terminals T**1**–TN. Thus, some control is imposed on an aggressive caller who might otherwise be given two opportunities to answer the same question.

Considering the system of FIG. **1** in greater detail, the exemplary telephone terminal T**1** includes a handpiece **10** (microphone and earphone) and a panel **12** provided with a rectangular array of individual push buttons **14** in a conventional configuration. Of course, the handpiece **10** accommodates analog signals while the panel **12** is a digital apparatus. During an interface operation, as disclosed in detail below, the caller is queued or prompted vocally through the handpiece **10** (earphone) to provide digital responses using the buttons **14**.

At this stage, some specific aspects of the communication interface are noteworthy. Essentially, as a result of telephonic dialing at one of the terminals T**1**–TN, the communication facility CO couples the select terminal to an audio response unit. Specifically, to illustrate various aspects, three separate audio response units are provided in the station CS to accept calls in the three distinct modes. That is, an audio response unit **18** receives calls in the "800" mode. An audio response unit **20** receives calls in the area-code dialing mode, and an audio response unit **22** receives calls in the "900" dialing mode.

It will be understood that although three separate audio response units are illustrated, systems incorporating the principles of the present invention may well incorporate various numbers of audio response units for each calling mode, with each audio response unit having the capability to accommodate a substantial number of calls as indicated by the lines from the communication facility CO in FIG. **1**. Alternatively, a single composite unit might be utilized. Also, the mode or aspects of the described embodiment might well be implemented singly or in various combinations. Herein, for purposes of explanation, calls are treated individually and processed accordingly through the three audio response units **18**, **20** and **22**.

Generally, the audio response units **18**, **20** and **22** connect callers at remote terminals T**1**–TN from the communication facility. CO through a coupler **24** (FIG. **1**, station CS, center) to an interface processor **26**. Both the coupler **24** and the processor **26** are connected to a control unit **28** that is also connected to the audio response units **18**, **20** and **22**. Accordingly, with overall supervision by the control unit **28**, the audio response units **18**, **20** and **22** answer and preliminarily qualify callers from the terminals T**1**–TN for connection through the coupler **24** to the interface processor **26**.

Upon completion of an interface connection in the disclosed embodiment, a contest format is executed by vocally prompting callers to respond with digital data. At this point, it is noteworthy that the communication facility CO also provides identification signals to the audio response units **18**, **20** and **22**. Specifically, digital identification signals representing numbers associated with the calling terminals T**1**–TN are provided by "ANI" equipment independent of any action by the caller. In the event "ANI" equipment is not available, callers may be vocally prompted to provide the digital representations by selectively depressing the buttons **14**.

The telephone communication facility CO also may provide digital signals indicating the called number. Generally, such a capability involves equipment designated "IDNIS". The capability may be useful in various embodiments of the present system, as to distribute calls from a single equipment as mentioned above.

Pursuing the exemplary structure of FIG. **1** in still greater detail, the communication facility CO provides three sets of trunks or lines LA**1**, LA**2** and LA**3** respectively coupled to the audio response units **18**, **20** and **22**. From the audio

response units **18**, **20** and **22**, sets of lines LB**1**, LB**2** and LB**3** are connected to the coupler **24**. Under control of the control unit **28**, the coupler **24** connects individual lines **37** of the sets LB**1**, LB**2** and LB**3** to the processor **26** through lines **39**.

Generally, the audio response units **18**, **20** and **22** may take the form of well known telephonic structures with the capability to "answer" calls and interface callers in a preliminary way. Each of the units **18**, **20** and **22** incorporate a voice generator along with some basic programmable logic capability.

The audio response unit **18** is coupled to a free-call memory **32**. Generally, the unit **18** in cooperation with the memory **32** operates with the control unit **28** to qualify acceptable calls in the "800" mode.

The audio response unit **20** is connected to a select-number coincidence detector **34**. These structures along with the control unit **28** test area-code mode calls. The audio response unit **22** accepts calls without initial qualification.

The system of the disclosed embodiment selectively qualifies callers depending on their calling mode. Additionally, the system responds to caller identification to enhance contest equity. Generally, the interface processor **26** poses questions to calling contestants and stores the resulting answers in a result memory **36**. Questions given to contestants are selected from a memory **38** by a random number generator **40**. Essentially, the memory **38** contains an inventory of questions addressable by numbers provided by the random number generator **40**. The address numbers from the generator **40** are also supplied to a coincidence detector **42** that also receives the address numerals of questions previously presented to a specific caller from a record **44**. Thus, before a question is presented to a caller, the number of the calling terminal is checked to assure that the same question has not previously been posed to a caller at that terminal.

If the coincidence detector **42** clears the, current question as not being repetitive, a gate **46** is qualified and the question is supplied from the memory **30** to the interface processor **26**. A voice generator within the interface processor **26** then provides signals through a designated line **39**, the coupler **24**, a line **37**, one of the audio response units and the communication facility CO to the connected remote terminal. As a result, the caller hears a simulated voice question. The answer is provided by the caller actuating the buttons **14** at the calling terminal. In that regard, the question may be in a multiple choice or true-false format to accommodate simple push button actions at the terminal,

In view of the above description of structural elements in the disclosed embodiment, a comprehensive understanding of the system may now best be accomplished by assuming certain operating conditions and describing the resulting operations. Accordingly, assume that the system CS is programmed to accommodate a relatively simple game format, that is, a sponsored contest for the promotion of a product, erg. the XYZ widget. Further assume the contest is of limited participation based either upon: the payment of a token fee ("900" calling mode), prearranged participation ("800" calling mode), lottery selection (area-code calling mode) or lottery selection in combination with either 800 or 900 calling modes. Considering exemplary possibilities of the format, the XYZ Widget might be advertised with an invitation to participate via the "900" calling mode. Alternatively, participants might be variously qualified as by select notification; however, in the exemplary format, such participants would incur a token charge imposed through "900" telephonic service. To consider an example, an offering might be stated: "If your last three phone digits are 972 you may call, 1) if you wish, call 1 900 XXXX972 ($0.95 service charge) provided your last three phone digits are 972; 2) if you have written in for a 'free to enter' you can use the one-time PIN number provided your last three phone digits are 972. In this case you can use the 'free' 800 number provided to you with your PIN number."

As indicated above, some telephone terminals do not accommodate "900" calling mode. Also, under certain circumstances, it is important to afford members of the public "free" access to participate in various games or contests. For example, such participation might be arranged by mail or other communication to provide a participant with a limited-use (i.e. one) qualification number. With use, the numbers are stored in the memory **32** and the list is checked subsequently to avoid repeat use.

A third class of contest participants might be considered lottery winners. For example, the sponsor might televise a drawing of three decimal digits to provide a sequence of three numbers. The three numbers might identify "winning" or "entitled" participants by corresponding to the last three numbers (digits) of their telephone number. For example, the drawing of the numbers "257" would entitle a single call participation from any of the telephone terminals T**1**–TN designated by a number, the last three digits of which are "257".

In an exemplary contest format, participants might be asked a few test questions (for minor prizes and the ability to participate in a lottery). of course, a vast variety of possibilities exist; and in that regard, interim prizes may be awarded to participants as the format proceeds from the initial call to the ultimate prize. At the present point, it is important to appreciate that the system accommodates participants using various telephone call modes with select qualification to participate in an interface format utilizing voice prompt and push-button digital communication. In accordance with the described example, the sponsor invites participants to enter using "900" calling mode service. As a part of such an invitation, persons are advised that "free" entry or participation may be gained by sending a self-addressed envelope to receive an entry number, e.g. eight digits, for use via "800" calling mode service. In the disclosed embodiment, the eight-digit numeral is coded for verification. Of course, numerous possibilities exist. As a simple example the second and sixth digits of the number might have a specific sum, e.g. seven or seventeen. That is, the second and sixth digits might be: three and four, five and two, six and one, seven and zero, nine and eight and so on. A qualifying number would be: "34726313", the second and sixth digits being four and three, respectively.

With the arrangements completed for calling entries in the "900" and "800" mode, the contest might operate for several days before being opened to area-calling participants. That is, the area-calling mode might be available only after a televised drawing entitling participation from a select group of telephone numbers for a limited period of time.

In view of the above assumptions and descriptions, consider now the operation of the system as depicted in FIG. **1** in relation to the process diagram of FIG. **2**. That is, assume the system of FIG. **1** is implemented and programmed to accommodate the exemplary operations as will now be described with reference to the process diagram of FIG. **2**.

First, suppose a caller at the terminal T**1** places a call in the "900" mode in response to an advertisement by a sponsor promoting XYZ Widgets. Perhaps the caller will receive at least a token gift and might qualify for a major lottery prize.

The assumed call involves the caller actuating the buttons **14** as for example to input: "1 900 5558945". As a result, signals are provided to the communication facility CO resulting in a connection from the remote terminal **T1** to the audio response unit **22**. With the connection, the communication system CO also provides thelaudio response unit **22** with digital identification signals representative of the designation for remote terminal **T1** ("212 627 2222"). The identification signals are provided by the ANI equipment within the communication facility CO and are registered by the audio response unit **22**. The operation is illustrated as a process step in FIG. **2** by the block **50** (upper right) for "900" mode calls.

As suggested above, it may be desirable for a format to provide a token award to all callers in the "900" mode. Recognizing, such particulars as possibilities, in the disclosed embodiment, calls in the "900" mode are passed through the audio response unit **22** (FIG. **1**) and the coupler **24** to the interface processor **26**. Accordingly, the interface processor **26** receives the calling number and processes the contest format as described in detail below.

The initial step of the format common to all call modes is represented by the block **52** in FIG. **2**. However, as calls in all modes are processed similarly from that point, before proceeding with the explanation, the preliminary operations attendant other calling modes first will be explained.

As explained above, certain accommodations are made for participation in the "800" (caller free) mode. Accordingly, assume a caller at the terminal **T1** has been given an identification number: "34726313" for use in the "800" mode. Accordingly, the caller dials a number, e.g. "800 555 3478", actuating the terminal **T1** and the communication facility CO to provide a connection with the audio response unit **18**. With communication, the audio response unit actuates an internal voice generator prompting the caller to key in his assigned number, "34726313". As the digits of the number are keyed in by the caller, they are supplied from the audio response unit **18** to the control unit **28** and the free-call memory **32**.

Within the control unit **28**, logic is provided for verifying the identification number as proper. In accordance with the simple example explained above, the control unit **28** would simply sum the second and sixth digits to test for a total of "7". The coincidence test is represented by the query block **56** in FIG. **2**. A indicated above, various codes and verification techniques are well known along with the apparatus for verifying assigned numbers.

If the control-unit **28** validates the qualification number "34726313", it is recorded in the free-call memory **32** for future checking against repeat use. Accordingly, each call in the "800" mode also involves a check or test from the audio response unit **18** to the memory **32** to determine whether or not the assigned qualification number has been previously used. The previous-use test is illustrated as a process step by the query block **58** in FIG. **2**.

If the control unit **28** determines the qualification number to be invalid or the memory **32** reveals the number has been previously used, the communication is aborted by the audio response unit **18**. For example, the audio response unit **18** may be actuated to provide simulated audio signals carrying a message terminating the communication. For example, the caller might be advised: "The number you have provided is not valid. Consequently, your participation cannot be accepted on that basis."

If the entered number is valid and has not been previously used, the tests indicated by the query blocks **56** and **58** (FIG. **2**) are positive and the process again proceeds to the common step as indicated by the block **52**, e.g. as to receive a token gift.

As indicated above, a third possibility for contest participation involves calling in the area-code mode. While numerous format possibilities exist, as suggested above, access for callers in the area-code mode might be limited to a relatively short period of time. For example, a television program advertising the XYZ Widget might include a drawing to select the telephone terminals from which callers may participate for a period of twenty-four hours. As indicated above, the drawing might identify the last three digits of telephone numbers for the approved terminals.

Following a relatively short time (e.g. one day) during which area-code callers may enter the contest, the contest might be Concluded with the ultimate winner or winners determined. In any event, assume the presence of a caller at the terminal **T2** with an approved telephone number, i.e. "212 627 2257". Somewhat as explained above with respect to other calling modes, keying operations by the caller at the remote terminal **T2** result in a connection through the communication system CO to the audio response unit **20**. As previously, the communication facility CO provides digital signals to the audio response unit **20** indicating the calling number (ANI). Thus, the calling number is registered as indicated by the block **62** in FIG. **2**. As previously, in the event ANI equipment is not operative to serve the remote terminal **T2**, then the caller may be asked to key in his telephone number for subsequent verification.

From the audio response unit **20**, the caller's number is supplied to the coincidence detector and storage unit **34** for a two-stage test. A first test simply seeks a coincidence between the approved number sequence (three digits) and the last three digits of the calling number. In the example, the last three digits of the calling number ("257") are compared with the select digit sequence, "257". The test is indicated by the query block **64** in FIG. **2**.

As a secondary test, the unit **34** may check a record of previous use. Thus, the unit **34** simply implements test logic to-accomplish these comparison-step operations with structures as well known in the prior art.

If the tests are negative, as indicated by the query block **64**, the communication is aborted as indicated by the block **60**. Alternatively, a favorable test again directs the system to proceed to the step of block **52** at which the process enters a common phase for all calling modes.

With the entry of a call into the common phase, the line carrying the call is connected through the coupler **24** (FIG. **1**) to the interface processor **26**. That is, depending on the call mode, the call is passed through one of the audio response units **18**, **20** or **22** and the coupler **24** to the interface processor **26**. Note that as indicated above, each of the audio response units **18**, **20** and **22** is capable of accommodating a large number of asynchronous calls. Similarly, the coupler **24** is capable of connecting lines from the audio response units **18**, **20** and **22** (LB**1**, LB**2** and LB**3** respectively) to the interface processor on an individual basis through lines **37** and **39**.

The interface processor **26** may comprise a relatively substantial computing capability for processing many individual calls with programmed variations. The processing operation is illustrated in FIG. **2** beginning with the block **52**. However, note that as the interface processor **26** receives the telephone number identifying a calling terminal (ANI) reference may be made toga data bank. Therefore, the operation might involve reference to substantial data on a

caller. Accordingly, a basis exists for several process variations accommodated by data from a bank. The block **52** represents such possibilities as well as further informing or processing callers.

With the receipt of a call at the interface processor **26**, a voice generator may be actuated to specifically inform a caller, depending upon the specific format employed. Essentially, digital signals are provided to actuate a voice generator within the processor **26**. Accordingly, an audio message is provided through the coupler **24**, the associated audio response unit, and the communication facility CO to the connected remote terminal. Thus, the caller may be further informed or cued.

In the disclosed embodiment, concurrently with the operation of further informing the caller, the interface processor **26** actuates the random number generator **40** to provide a random address for the question memory **38**. The process step is illustrated in FIG. **2** by the block **66**.

The random number (identifying a question in the memory **38**) is also provided to the coincidence detector **42** to test for the previous use of the question to the calling terminal. In that regard, the interface processor **26** provides the caller telephone number (ANI) to the caller record **44** which may simply take the form of a look-up table addressed by calling numbers and revealing the identification of previous questions propounded. The addresses of questions previously recorded for a calling number are supplied to the coincidence detector **42** for comparison with the current tentative question identification number. The process step is illustrated by the query block **68** in FIG. **2**.

If the tentative question has been previously used for the calling terminal, a signal is provided from the coincidence detector **42** to the interface processor prompting a repeat operation by the random number generator **40** to select another question.

Alternatively, if the tentative question is not a repeat, then the coincidence detector **42** qualifies the gate **46** and the tentative question is supplied to the interface processor **26** for actual use. Note that upon the occurrence,of an approved question, the coincidence detector also supplies a signal to the call ,record **44** which records the identification number of the question. The process step is illustrated in FIG. **2** by the block **70**.

With the provision of signals representing a question through the gate **46** to the interface processor **26**, the internal voice generator is actuated to propound the question to the caller. Recognizing the vast possibilities for contest formats, one or more rather difficult questions might be propounded to isolate lottery participants. Alternatively, a relatively easy question may be propounded as a minor obstacle to participation in the final phase of the contest. In any event, as prompted or cued, the caller responds using the buttons **14** and the response is registered for testing within the interface processor **26**. The process steps are indicated by the block **72** and the query block **74** in FIG. **2**. The results of the tests are then stored in the interface result memory **36**. Note that in the interests of human perception, a printed record may be developed concurrently with the qualification of lottery participants.

Final processing to determine a winner or winners may involve any of various operations as a drawing, an event, and so on. Accordingly, as indicated by the blocks **76** and **78**, final determinations are made of winners and losers with predetermined prize allocations. Thus, the system of the present invention enables effective regulation and control of interfaces between persons at telephone stations and a central processing apparatus. Calls in various modes are accommodated with appropriate tests, and interface data (e.g. test questions) are qualified.

In view of the above descriptions, it will be apparent that the disclosed embodiment is susceptible to considerable modification in the implementation of the present invention in conjunction with a telephone system to accommodate caller interface operations. Although the disclosed embodiment is directed to a contest, it will be apparent that aspects of the system may be variously embodied to accommodate any of a variety of telephone interface operations. Furthermore, it will be apparent that while the disclosed embodiment comprises specific elements and configurations, any of a variety of structures might well be utilized. Accordingly, the scope hereof is deemed to be as set forth in the claims below.

What is claimed is:

1. A telephone interface system for individually interfacing callers at a multitude of remote terminals for voice-digital communication through a telephone communication facility in accordance with an interface format, and involving digital signals including dialed number identification signals and calling number identification data provided automatically by said telephone communication facility, said system comprising:

communication means for receiving said dialed number identification signals to select said interface format from a plurality of formats and establishing telephone communication with currently active callers at certain of said multitude of remote terminals through said telephone communication facility;

means for receiving said calling number identification data for said callers and comparing against a database of stored calling number identification data;

means for providing identification signals to said communication means indicative of said currently active callers;

memory means for storing caller cues and use indications for said caller cues in relation to said callers as identified by said identification signals and answer data provided by said callers in response to said caller cues;

cue means for receiving said caller cues to provide voice signals through said communication means to prompt said answer data from said currently active of said callers in the form of digital data signals;

means for selecting a current caller cue from said memory means for one of said currently active callers for application to said cue means under control of said identification signals in order to prevent duplicate provision of a caller cue to a particular caller under control of said identification signals; and

means for processing at least certain of said answer data provided by said callers.

2. A telephone call processing system for receiving calls from a multitude of terminals in different call modes including a "900" caller-charge call mode and at least an "800" toll free call mode for processing to an interface format and involving digital signals including digital signals indicative of DNIS, said system comprising:

first response unit for receiving calls in said "900" caller-charge call mode under control of DNIS for processing to common operations of said interface format;

second response unit for receiving calls in said "800" toll free call mode under control of DNIS for processing to common operations of said interface format;

voice generator means for providing different automated greetings under control of DNIS to callers calling in said "900" caller-charge call mode and callers calling in said "800" toll free call mode and prompting said callers calling in at least said "800" call mode to enter data; and

processing means for processing at least certain of said data entered by said callers.

3. A telephone call processing system according to claim **2**, further comprising:

qualification means for testing for approval at least certain of the data entered by the callers calling in said "800" toll free call mode.

4. A telephone call processing system according to claim **3**, wherein said at least certain of the data entered by the callers is further tested against a record of previous use.

5. A telephone call processing system according to claim **3**, wherein said qualification means further implements a test with respect to a limit on a period of time.

6. A telephone call processing system according to claim **5**, wherein said at least certain data entered by the callers is further tested against a record of previous use.

7. A telephone call processing system according to claim **2**, wherein said processing means processes at least certain of said data entered by said callers to isolate a subset of callers.

8. A telephone call processing system according to claim **7**, wherein said processing means processes on-line at least certain of said data entered by said callers to isolate a subset of callers.

9. A telephone call processing system according to claim **2**, wherein said interface format is an information service format.

10. A telephone call processing system according to claim **2**, wherein said first response unit and said second response unit are incorporated within a single composite unit.

11. A telephone interface system for individually interfacing callers at a multitude of remote terminals for voice-digital communication through a telephone communication facility in accordance with an interface format, and involving digital signals including dialed number identification signals provided automatically by said telephone control of said identification signals; and

means for processing at least certain of said answer data provided by said callers.

12. A telephone interface system according to claim **11**, wherein said comparing means receives data entered by the callers as at least a part of said identification signals and tests the data entered by the callers for approval.

13. A telephone interface system according to claim **12**, wherein said comparing means further implements a test based upon a limited period of time.

14. A telephone interface system according to claim **12**, wherein said comparing means further tests the data entered by the callers against a record of previous use.

15. A telephone interface system according to claim **11**, wherein said interface format is an information service format.

16. A telephone interface system according to claim **11**, wherein said means for processing processes at least certain of said answer data provided by said callers to isolate a subset of callers.

17. A telephone interface system according to claim **16**, wherein said means for processing processes on-line at least certain of said answer data to isolate a subset of callers.

18. A telephone interface system for individually interfacing callers at a multitude of remote terminals for voice-digital communication through a telephone communication facility, said system comprising:

communication means for establishing telephone communication between callers at certain of said multitude of remote terminals and a select data format selected from a plurality of data formats through said telephone communication facility based on digital signals (DNIS) automatically provided by said telephone communication facility to access said select data format; said select format in one form thereof preventing duplication of caller cues;

means for providing identification signals to said communication means indicative of currently active of said callers;

memory means for storing one or more caller cues and use indications for said caller cues in relation to said currently active of said callers as identified by said identification signals;

cue means for receiving said caller cues to provide responses from said currently active callers in the form of digital data signals; and

means for selecting a caller cue from said memory means for said currently active caller for application to said cue means under control of said identification signals and said use indications stored in said memory means for said currently active caller whereby to limit and control caller cues provided to individual callers based upon cues previously provided to and identified with said individual callers.

19. A telephone call processing system for receiving calls through a telephonic communication facility from a multitude of terminals in a toll free call mode such as an "1800" call mode for processing data in accordance with an operating process format and involving digital signals including DNIS signals, said system comprising:

receiving structure for receiving calls in different call modes wherein digital signals indicative of dialed numbers identify at least two of a plurality of toll free called numbers and a plurality of caller charge called numbers;

voice generator coupled to said receiving structure for prompting callers whereby callers enter data in response to voice prompts:

connection structure for connecting substantially all of said callers calling at least two of said plurality of toll free called numbers and said caller charge called numbers to a common phase of an interface format; and

audio control unit coupled to said communication means for providing distinct automated greetings to callers calling at least two of said plurality of toll free called numbers and said caller charge called numbers under control of said digital signals including DNIS signals prior to connection to said common phase of said interface format.

20. A telephone call processing system according to claim **19**, further comprising:

means for processing data entered by said callers to isolate a subset of callers.

21. A telephone call processing system according to claim **19**, further comprising:

memory for storing certain data provided by said callers.

22. A telephone call processing system according to claim **19**, wherein said receiving structure receives select digits of caller telephone numbers automatically provided by digital signals from said telephonic communication facility.

23. A telephone call processing system according to claim 22, further comprising:

memory for storing said select digits of caller telephone numbers.

24. A telephone call processing system according to claim 19, wherein said interface format is one of a plurality of formats selected under control of said DNIS signals.

25. A telephone call processing system according to claim 19, further comprising, qualification structure for testing caller identification data entered during calls calling at least two of said plurality of toll free called numbers.

26. A telephone call processing system according to claim 25, wherein said qualification structure further implements a test based on a limited period of time.

27. A telephone call processing system according to claim 25, wherein said qualification structure further tests the caller identification data against a record of previous use.

28. A telephone call processing system for receiving calls through a telephonic communication facility from a multitude of terminals in a toll free call mode for processing data in accordance with an operating process format and involving digital signals including called number identification signals (DNIS) automatically provided by said telephonic communication facility, said system comprising:

first response unit means for receiving calls in said toll free call mode wherein said called number identification signals (DNIS) indicative of at least one of a plurality of distinct called numbers identifies said operating process format;

voice generator means for prompting callers to enter data in response to voice prompts wherein said data entered by said callers is used to update data for said callers in a database relating to said callers;

qualification means for qualifying at least said calls utilizing said one of said plurality of distinct called numbers in said toll free call mode received by said first response unit to provide qualified calls based upon a test of caller entered identification data including caller pin-number data based upon limited use;

second response unit means for receiving calls in said toll free call mode wherein called number identification signals (DNIS) indicative of one other of said plurality of distinct called numbers identifies said operating process format;

means for concurrently processing calls received by said first response unit means and said calls received by said second response unit for concurrent processing of data in accordance with common operations of said operating process format.

29. A telephone call processing system according to claim 28, further comprising:

audio control unit for providing an automated greeting under the control of said called number identification signals (DNIS) to callers calling at least one of said distinct called numbers whereby said automated greeting is specific to said one of said plurality of distinct numbers; and

a third response unit means for receiving calls in an area code call mode, said calls received by said third response unit means concurrently processed with said calls received by said first and second response unit means in accordance with said common operations of said select operating process format.

30. A telephone call processing system according to claim 29, wherein said select operating process format is one selected from a plurality of distinct operating process formats.

31. A telephone call processing system according to claim 28, wherein said select interface format is one selected from a plurality of distinct operating process formats.

32. A telephone call processing system according to claim 28, wherein said means for concurrently processing processes data provided by callers to update a databank relating to said callers.

33. A telephone call processing system according to claim 28, wherein said means for concurrently processing comprises multiple comparative processing operations to isolate a subset of callers.

34. A telephone call processing system according to claim 28, wherein at least select digits of caller telephone numbers are automatically provided by digital signals from the telephonic communication facility.

35. A telephone call processing system according to claim 28 wherein said first response unit means and said second response unit means are incorporated within a single composite unit.

36. A telephone call processing system for receiving calls from a multitude of terminals for processing to an interface format and involving digital signals including digital signals associated with said terminals as for identification or data, said system comprising:

cue means for prompting responses to questions, from said terminals in the form of digital signals as data;

question selection means for selecting individual questions from a plurality of questions for actuating said cue means, said selection means including a random selection means to select said individual questions;

test means for testing individual questions as correct or incorrect;

processing means to process responses to said individual questions to isolate a subset of callers; and

memory means for storing data and control means for restricting the extent of access to said system based on at least one of caller provided data or calling terminal data automatically provided by said telephonic communication facility.

37. A telephone call processing system for receiving calls through a telephonic communication facility from a multitude of terminals in a pay to dial call mode for processing data in accordance with any of a plurality of operating process formats and involving digital signals including DNIS, said system comprising:

first response unit means for receiving calls in said pay to dial call mode wherein digital signals indicative of at least one of a plurality of distinct called numbers (DNIS) identify one of said plurality of operating process formats;

voice generator means for prompting callers whereby said callers enter data in response to voice prompts;

qualification means for qualifying at least said calls utilizing said one of said plurality of distinct called numbers (DNIS) in said toll free call mode received by said first response unit to provide qualified calls;

second response unit means for receiving calls in said pay to dial call mode wherein digital signals indicative of one other of said plurality of distinct called numbers (DNIS) identify another of said plurality of operating process formats;

means for processing calls received by said first response unit means and said calls received by said second response unit for concurrent processing of data in accordance with certain common processing operations of said one and said another of said operating process formats.

38. A telephone call processing system according to claim 37, further comprising:

audio control unit for providing an automated greeting under the control of said DNIS to callers calling at least one of said distinct called numbers whereby said automated greeting is specific to said pay to dial mode.

39. A telephone call processing system according to claim 37, wherein said voice generator means prompts responses to at least one question in the form of interactively entered data provided by said callers calling at least one of said distinct called numbers; and said system further comprises:

means for storing said interactively entered data.

40. A telephone call processing system according to claim 37, further comprising:

means for providing identification signals to said qualification means indicative of currently active of said callers;

memory means for storing one or more caller cues and use indications for said caller cues in relation to said currently active of said callers as identified by said identification signals;

cue means for receiving said caller cues to provide responses from said currently active callers in the form of digital data signals; and

means for selecting a caller cue from said memory means for said currently active caller for application to said cue means under control of said identification signals and said use indications stored in said memory means for said currently active caller whereby to limit and control caller cues provided to individual callers based upon cues previously provided to and identified with said individual callers.

41. A telephone call processing system according to claim 37, wherein said means for processing calls processes caller entered data to isolate a subset of said callers.

42. A telephone call processing system according to claim 37, wherein said means for processing calls utilizes multiple comparative processing operations to isolate said subset of callers.

43. A telephone call processing system according to claim 37, wherein said one of said plurality of operating processing formats is a form of an information service format.

44. A telephone call processing system according to claim 37, wherein said means for processing calls isolates a subset of callers based upon data entered by said callers responsive to prompting by said voice generator means and wherein said means for processing calls further isolates a sub-subset of callers also responsive to further data entered by said callers responsive to further prompting by said voice generator means.

45. A telephone call processing system according to claim 37, wherein qualification by said qualification means of said calls includes qualification of caller provided identification data.

46. A telephone call processing system according to claim 37, wherein said pay to dial call mode is a "900" call mode.

47. A telephone call processing system according to claim 37, further comprising:

audio control unit for providing a preliminary automated greeting under the control of said DNIS to callers calling at least one of said distinct called numbers whereby said preliminary automated greeting is specific to said one of said plurality of distinct numbers and prior to execution of common operations of said one operating process format.

48. A telephone call processing system according to claim 37, wherein said system further receives calls with respect to another operating process format accessed in a toll free mode under control of said DNIS.

49. A telephone call processing system according to claim 48, wherein said toll free mode is an 800 number.

50. A telephone call processing system according to claim 49, wherein said callers to said toll free number provide qualification data.

51. A telephone call processing system according to claim 49, wherein said qualification number is tested for a use limit.

52. A telephone call processing system according to claim 37, wherein qualification means tests data entered by the callers for approval.

53. A telephone call processing system according to claim 52, wherein the qualification means further tests the data entered by the callers against a record of previous use.

54. A telephone call processing system according to claim 52, wherein the qualification means further implements a test with respect to a limited period of time.

55. A telephone call processing system according to claim 37, wherein said first response unit means and said second response unit means are incorporated within a single composite unit.

56. A process for interfacing, through a telephone-communication facility, (1) callers who are at a multitude of remote terminals for voice-digital communication with (2) a system for prompting the callers with caller cues, said process comprising the steps of:

establishing telephone communications between the callers and the system. the system having a receiving unit for receiving digital signals including dialed-number identification signals provided automatically from the telephone-communication facility;

utilizing the dialed-number identification signals to identify one from a plurality of numbers dialed by the callers;

also receiving at the receiving unit identification signals relating to the callers;

testing said identification signals relating to the callers to determine whether to qualify the callers for access to at least a portion of operations of the system;

utilizing, for qualified callers, the identification signals relating to the callers, to avoid prompting certain callers with a certain previously provided cue or cues; and

providing to the qualified callers at least one other caller cue.

57. A process according to claim 56, wherein the identification signals relating to the callers comprise a number entered by each of the callers to determine if that caller is eligible to participate.

58. A process according to claim 56, wherein the process further implements a test with respect to a limit on a period of time.

59. A process according to claim 56, wherein during the testing step, the number entered by the caller is further tested to determine if it has exceeded a limit on extent of access, during a limited period to time.

60. A process according to claim 56, wherein during the testing step, the process further tests the identification signals against a record of previous use.

61. A process according to claim 56, wherein the identification signals relating to the callers are calling number identification signals automatically provided by the telephone-communication facility.

62. A process according to claim 56, further comprising the step of:

processing, to isolate a subset of callers, caller-response signals responsive to certain of the plurality of caller cues.

63. A process according to claim **62**, wherein during the processing step, the response signals are processed on-line.

64. A process according to claim **62**, wherein during the processing step, the response signals are processed off-line.

65. A process according to claim **56**, wherein the dialed-number identification signals identify both "800" and "900" called numbers.

66. A process according to claim **56**, further comprising the step of: selecting from a plurality of operating process formats, utilizing the dialed-number identification signals received from the telephone-communication facility, a select format.

67. A process for interfacing, through a telephone-communication facility, (1) callers who are at a multitude of remote terminals for voice-digital communication with (2) a system for prompting the callers with caller cues, said process comprising the steps of:

receiving identification signals at a receiving unit of the system, the identification signals indicating telephone numbers of the multitude of remote terminals, the identification signals being automatically provided by the telephone-communication facility;

testing, to determine whether to qualify the callers for voice-digital communication with the system, the identification signals that indicate the telephone numbers;

utilizing, for qualified callers, the identification signals that indicate the telephone numbers to avoid prompting certain callers with a certain previously provided cue or cues; and

providing to the qualified callers at least one other caller cue.

68. A process according to claim **67**, wherein during the testing step, the process further tests, against a record of previous use, the identification signals.

69. A process according to claim **67**, wherein during the receiving step, the receiving unit also receives called-number identification signals that are automatically provided by the telephone-communication facility, and utilizing the called-number identification signals to identify a select format from a plurality of formats.

70. A process according to claim **69**, further comprising the step of:

testing the identification signals that indicate the telephone number, to determine whether to qualify the callers to access the select format, by testing to determine whether each caller has exceeded a limit on use; and

further implementing a test based on a limit on a period of time.

71. A process according to claim **69**, wherein the called-number identification signals identify both "800" and "900" called numbers.

72. A process according to claim **67**, further implementing a test with respect to a limit on a period of time.

73. A process according to claim **67**, further comprising the step of:

processing, to isolate a subset of callers, response signals provided by the callers in response to certain of the plurality of caller cues with which the callers are prompted.

74. A process according to claim **73**, wherein during the processing step, the response signals are processed on-line.

75. A process according to claim **73**, wherein during the processing step, the response signals are processed off-line.

76. A process for interfacing, through a telephone-communication facility, (1) callers who are at a multitude of remote terminals for voice-digital communication with (2) a system for prompting the callers with caller cues, said process comprising the steps of:

receiving, at a receiving unit of the system, identification signals relating to the callers that include (a) calling signals indicating telephone numbers of the multitude of remote terminals, the calling signals being automatically provided by the telephone-communication facility and (b) signals that represent data entered by the callers at the multitude of remote terminals;

testing the identification signals relating to the callers to determine whether to qualify the individual callers to use all or part of the process, by testing to determine if the calling signals indicating each of the telephone numbers indicate a valid identification number for each caller that has not exceeded a limit on use, and by further implementing a test based on a predetermined period of time;

utilizing for qualified callers, to avoid prompting certain callers with a certain previously provided cue or cues, the calling signals that indicate the telephone numbers; and

providing to the qualified callers at least one other caller cue.

77. A process according to claim **76**, further comprising the step of:

also receiving called-number identification signals that are automatically provided by the telephone-communication facility; and

utilizing the called-number identification signals to select a format from a plurality of formats and connecting the callers at the multitude of remote terminals with the format.

78. A process according to claim **77**, wherein the plurality of formats are accessed by both 800 and 900 calling modes, callers entering data in response to the caller cues with which they are prompted.

79. A process according to claim **76**, further comprising the step of:

processing, to isolate a subset of callers, the data entered by the callers in response to caller cues.

80. A process according to claim **79**, wherein during the processing step, the data entered by the callers is processed on-line.

81. A process according to claim **76**, wherein the limit on use is one.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,974,120
DATED : October 26, 1999
INVENTOR(S) : Ronald A. Katz

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 4,
Line 60, "IDNIS" should be -- DNIS --.

Column 5,
Line 38, "the, current" should be -- the current --.
Line 57, "erg." should be -- e.g. --.

Column 7,
Line 6, "thelaudio" should be -- the audio --.

Column 8,
Line 16, "Concluded" should be -- concluded --.
Line 66, "toga" should be -- to a --.

Column 12, claim 19,
Line 32, "1800" should be -- 800 --.

Column 16, claim 59,
Line 58, "to" should be -- of --.

Signed and Sealed this

Twenty-sixth Day of March, 2002

Attest:

Attesting Officer

JAMES E. ROGAN
Director of the United States Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,974,120
DATED : October 26, 1999
INVENTOR(S) : Ronald A. Katz

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 11,
Line 42, delete "control of".
Line 43, delete "said identification signals; and" and insert the following:

-- communication facility, said system comprising:
communication means for receiving said dialed number identification signals to select said interface format from a plurality of formats and establishing telephone communication with currently active callers at certain of said multitude of remote terminals through said telephone communication facility;
means for providing identification signals to said communication means indicative of said currently active callers;
means for comparing said identification signals against a database of stored identification data;
memory means for storing caller cues and use indications for said caller cues in relation to said callers as identified by said identification signals and additional answer data provided by said callers in response to caller cues;
cue means for receiving said caller cues to provide voice signals through said communication means to prompt said answer data from said currently active of said callers in the form of digital data signals;
means for selecting a current caller cue from said memory means for one of said currently active callers for application to said cue means under control of said identification signals in order to prevent duplicate provision of a caller cue to a particular caller under control of said identification signals; and --.

Signed and Sealed this

Sixth Day of August, 2002

Attest:

Attesting Officer

JAMES E. ROGAN
Director of the United States Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,974,120
DATED : October 26, 1999
INVENTOR(S) : Ronald A. Katz

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 16,
Line 52, after "according to claim" please delete "56" and replace with the following:
-- 57 --

Signed and Sealed this

Twenty-sixth Day of November, 2002

Attest:

Attesting Officer

JAMES E. ROGAN
Director of the United States Patent and Trademark Office

EXHIBIT 18

US006035021A

United States Patent [19]

Katz

[11] Patent Number: 6,035,021

[45] Date of Patent: *Mar. 7, 2000

[54] **TELEPHONIC-INTERFACE STATISTICAL ANALYSIS SYSTEM**

[76] Inventor: **Ronald A. Katz**, 570 S. Mapleton Dr., Los Angeles, Calif. 90024

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **08/475,425**

[22] Filed: **Jun. 7, 1995**

Related U.S. Application Data

[62] Division of application No. 07/335,923, Apr. 10, 1989, which is a continuation of application No. 07/194,258, May 16, 1988, Pat. No. 4,845,739, which is a continuation-in-part of application No. 07/018,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of application No. 06/753,299, Jul. 10, 1985, abandoned.

[51] **Int. Cl.**[7] **H04M 11/00**

[52] **U.S. Cl.** **379/93.12**; 379/93.02

[58] **Field of Search** 379/92, 97, 91, 379/94, 93, 95, 88, 89, 110, 142, 91.01, 91.02, 92.01, 92.03, 93.02, 93.03, 93.12, 93.13, 93.14

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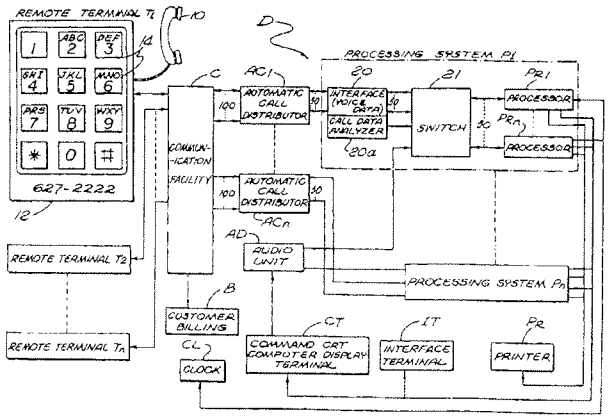
Primary Examiner—Stella Woo

Attorney, Agent, or Firm—Lyon & Lyon LLP

[57] **ABSTRACT**

A system D interfaces with a multiplicity of individual terminals T1–Tn of a telephone network facility C, at the terminals callers are prompted by voice-generated instructions to provide digital data that is identified for positive association with a caller and is stored for processing. The caller's identification data is confirmed using various techniques and callers may be ranked and accounted for on the basis of entitlement, sequence or demographics. Callers are assigned random designations that are stored along with statistical and identification data. A break-off control circuit may terminate the computer interface aborting to a terminal for direct communication with an operator. Real-time operation processing is an alternative to stored data. The accumulation of stored data (statistical, calling order sequence, etc.) is variously processed and correlated as with developed or established data to isolate a select group or subset of callers who can be readily identified and reliably confirmed. Different program formats variously control the processing of statistical data as for auction sales, contests, lotteries, polls, commercials and so on.

12 Claims, 6 Drawing Sheets



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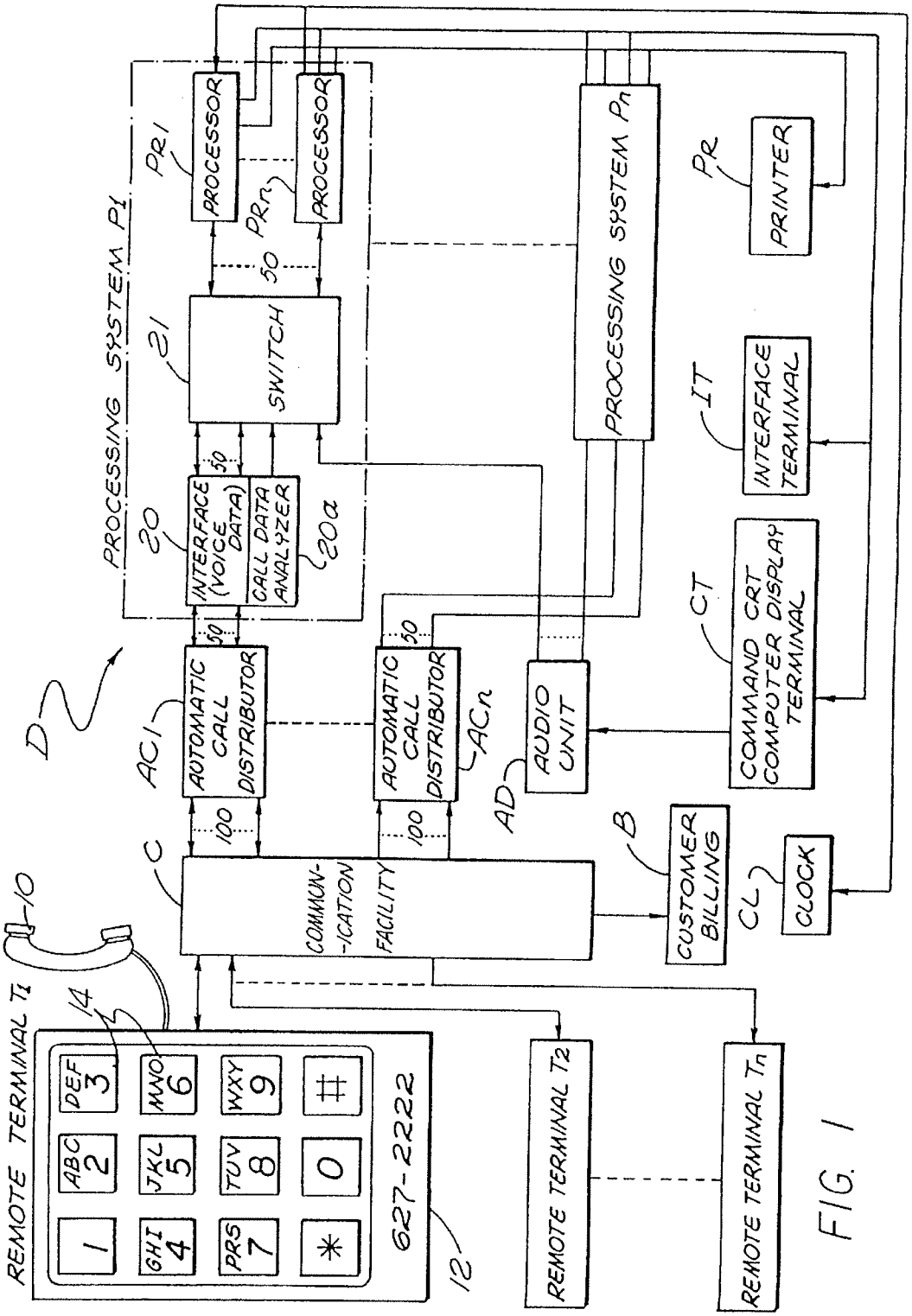

PROCESSING SYSTEM P1
PR1
PROCESSOR
PRn
PROCESSOR
50
21
SWITCH
50
20
INTERFACE (VOICE DATA)
CALL DATA ANALYZER
20a
50
50
D
AC1
AUTOMATIC CALL DISTRIBUTOR
ACn
AUTOMATIC CALL DISTRIBUTOR
100
100
C
COMMUN-ICATION FACILITY
10
REMOTE TERMINAL T1
14
DEF 3
MNO 6
WXY 9
#
ABC 2
JKL 5
TUV 8
0
1
GHI 4
PRS 7
*
627-2222
12
REMOTE TERMINAL T2
REMOTE TERMINAL Tn
PROCESSING SYSTEM Pn
AUDIO UNIT
AD
B
CUSTOMER BILLING
CL
CLOCK
PR
PRINTER
IT
INTERFACE TERMINAL
CT
COMMAND CRT COMPUTER DISPLAY TERMINAL

FIG. 1

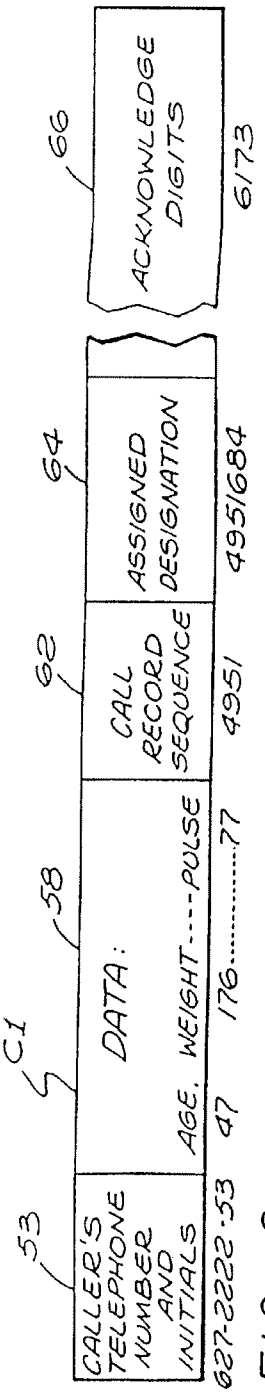


FIG. 2

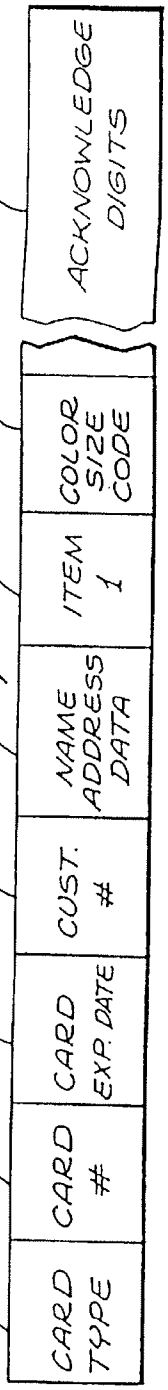


FIG. 5

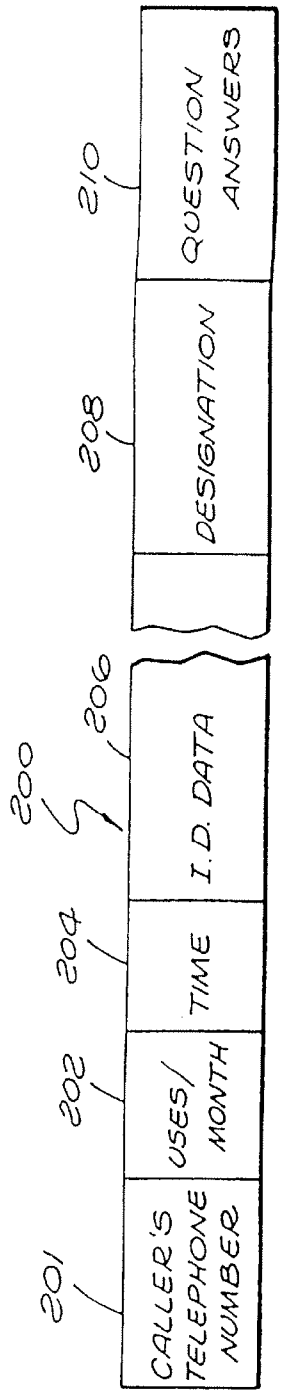


FIG. 7

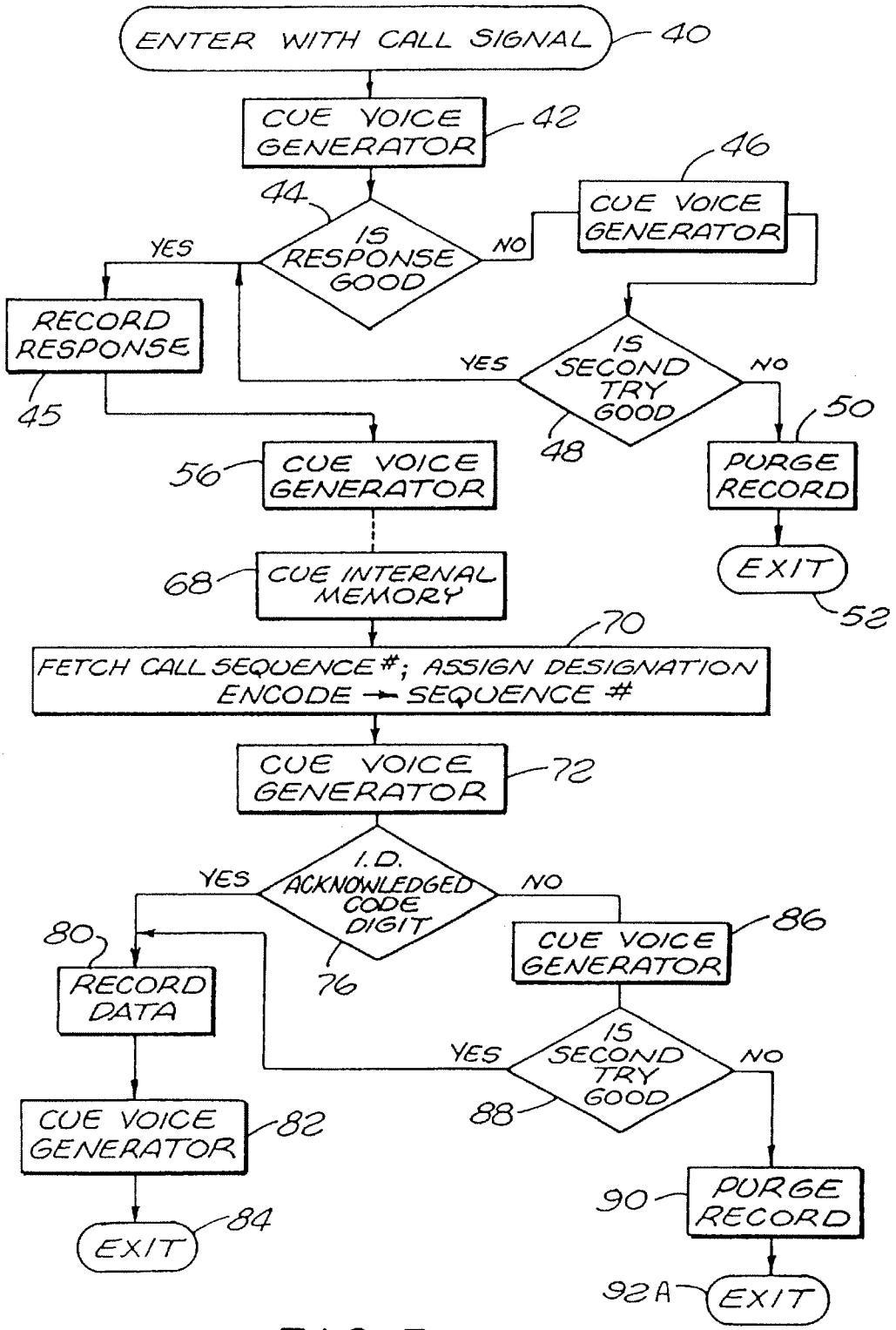

ENTER WITH CALL SIGNAL
40
CUE VOICE GENERATOR
42
46
44
IS RESPONSE GOOD
YES
NO
CUE VOICE GENERATOR
RECORD RESPONSE
45
YES
IS SECOND TRY GOOD
NO
48
50
56
CUE VOICE GENERATOR
PURGE RECORD
68
CUE INTERNAL MEMORY
EXIT
52
70
FETCH CALL SEQUENCE #; ASSIGN DESIGNATION ENCODE → SEQUENCE #
CUE VOICE GENERATOR
72
I.D. ACKNOWLEDGED CODE DIGIT
YES
NO
80
76
86
RECORD DATA
CUE VOICE GENERATOR
YES
IS SECOND TRY GOOD
NO
88
CUE VOICE GENERATOR
82
90
PURGE RECORD
EXIT
84
92A
EXIT

FIG. 3

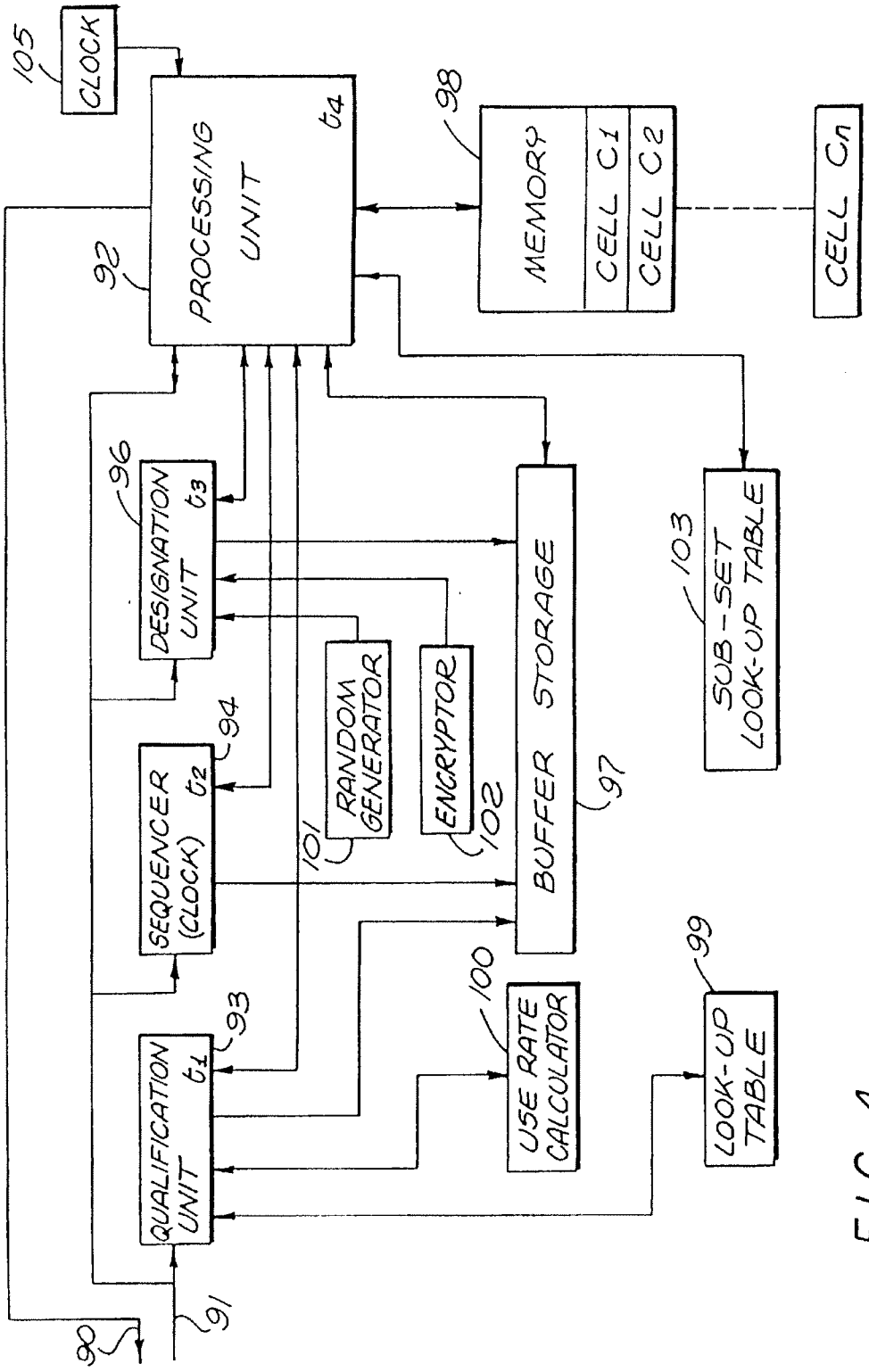

105
CLOCK
PROCESSING UNIT
t4
92
98
MEMORY
CELL C1
CELL C2
CELL Cn
96
DESIGNATION UNIT
t3
94
SEQUENCER (CLOCK)
t2
101
RANDOM GENERATOR
ENCRYPTOR
102
BUFFER STORAGE
97
103
SUB-SET LOOK-UP TABLE
93
QUALIFICATION UNIT
t1
100
USE RATE CALCULATOR
99
LOOK-UP TABLE
90
91

FIG. 4

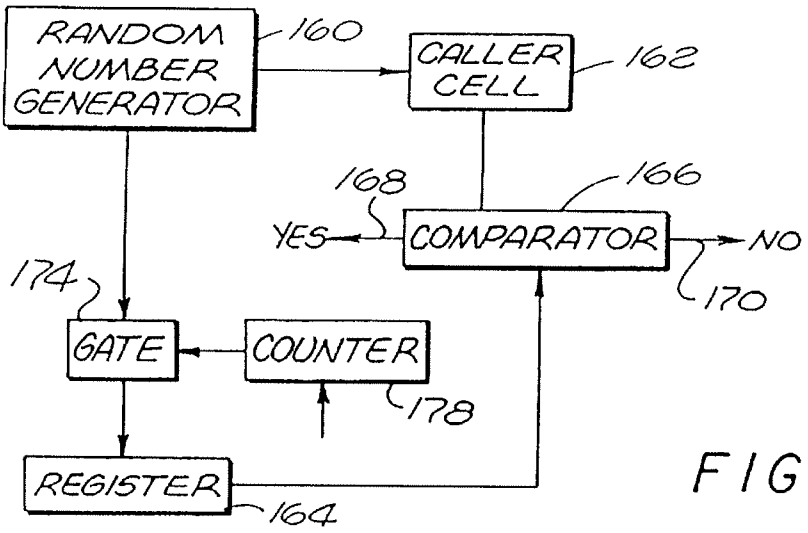
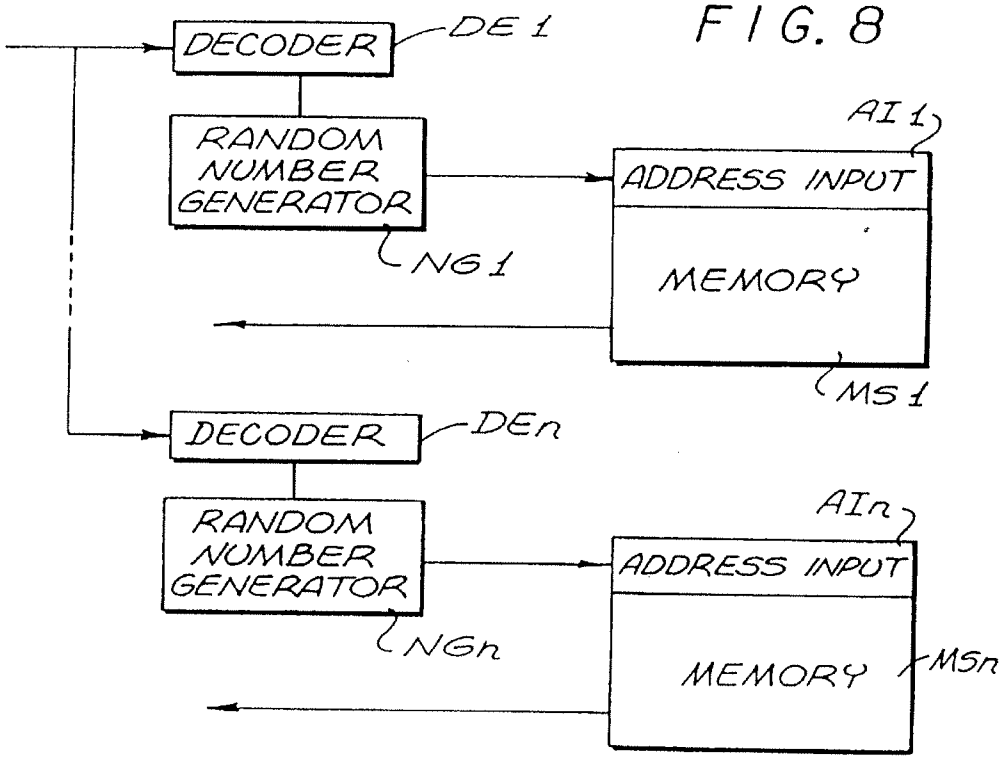

RANDOM NUMBER GENERATOR
160
CALLER CELL
162
168
166
YES
COMPARATOR
NO
170
174
GATE
COUNTER
178
REGISTER
164

FIG. 6

FIG. 8


DECODER
DE 1
RANDOM NUMBER GENERATOR
NG 1
AI 1
ADDRESS INPUT
MEMORY
MS 1
DECODER
DEn
RANDOM NUMBER GENERATOR
NGn
AIn
ADDRESS INPUT
MEMORY
MSn

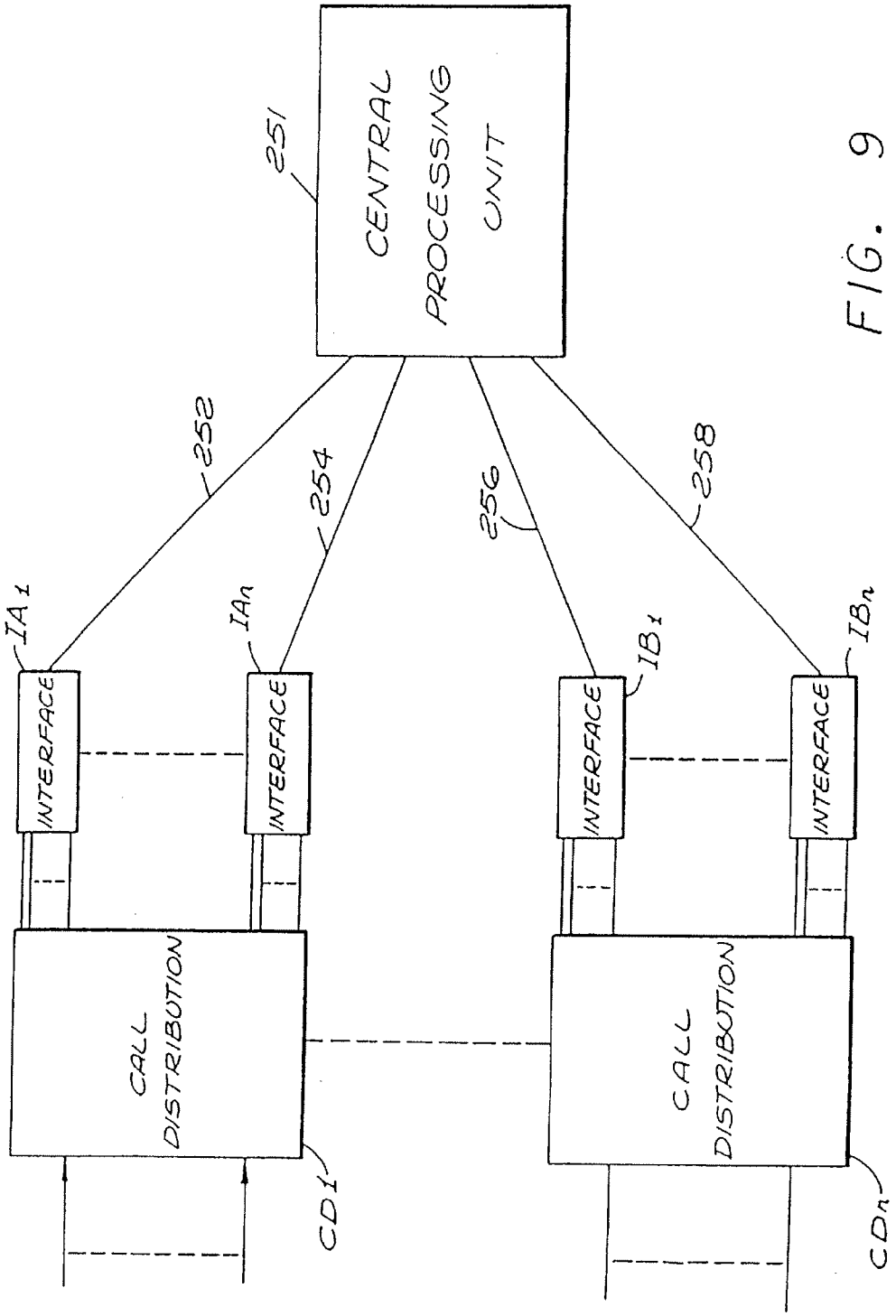

CENTRAL PROCESSING UNIT
251
252
254
256
258
IA 1
IAn
IB 1
IBn
INTERFACE
INTERFACE
INTERFACE
INTERFACE
CALL DISTRIBUTION
CALL DISTRIBUTION
CD 1
CDn

FIG. 9

TELEPHONIC-INTERFACE STATISTICAL ANALYSIS SYSTEM

BACKGROUND AND SUMMARY OF THE INVENTION

This is a divisional application of application Ser. No. 07/335,923 filed Apr. 10, 1989, and entitled "Telephonic-Interface Statistical Analysis System", which was a continuation of application Ser. No. 07/194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U.S. Pat. No. 4,845,739, which is a continuation-in-part of application Ser. No. 07/018,244 filed Feb. 24, 1987, and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 4,792,968, which was a continuation-in-part of application Ser. No. 06/753,299 filed Jul. 10, 1985 ABN, and entitled "Statistical Analysis System For Use With Public Communication Facility".

Various forms of publicly accessible communication systems for providing access to a central station have been proposed, some involving telecommunications. However, sometimes a need for ancillary functions arise in that regard, e.g. it may be desirable to positively identify a large group of persons, as a demographically controlled group, or a specifically entitled group, then statistically analyze data from the group so as to accurately identify certain persons in the group and select a subset of at least one person. Specifically, it may be desirable to obtain medical data from an entitled group of people, to correlate such data, perhaps introduce external data, then identify a select subset of the group. In that regard, a need exists for an improved, effective, economical, and expedient system of telecommunication incorporating means for performing qualification, identification, analysis and selection of individual persons.

It has been proposed to interface persons at telephone calling stations directly with a computer facility. In accordance with such arrangements, recorded voice messages prompt callers to provide data by actuating the alphanumeric buttons that are conventionally employed for dialing from one telephone station to another. In one prior arrangement, a caller may actuate dialing buttons to selectively attain a communication channel or to address specific information in a computer. In another arrangement, dialing buttons may be actuated to specify a billing designation as for requested services. Generally, such systems are believed to have been somewhat limited in scope, often involving difficulties that are frustrating or confusing to a caller. Nevertheless, such techniques have been widely used to enhance and broaden communication.

In general, the present invention comprises a telephonic-interface system and related process for selectively utilizing both analog (voice) and digital telephonic communication in a variety of different interface formats or programs, as to select or qualify a set of callers, enable positive identification of at least certain of the callers in the set, acquire data from callers in the set, statistically analyze acquired data, as in combination and in association with external data (time independent), and accordingly to isolate a subset of the callers with verifiable identification. That is, the external data (separate from caller-provided data) may be introduced at any of a variety of different times in relation to the caller data.

For example, a voice origination apparatus may prompt individual callers who (after qualification) provide select digital data to develop a record for further processing either immediately, upon the evolution of a defined set of callers or upon the establishment of select external data. Thus, following a qualification phase, the information acquisition phase may be concurrent or consecutive with respect to the processing phase. When appropriate, abort capability allows a caller to remain "off hook" and go to analog (vocal) communication. The caller then interfaces directly with an operator.

The system of the present invention may qualify an entitled set of callers, then receive answer data in the course of the call and develop identification or designation data, sequence data and statistical data. The system may then provide data cells for storing individual data while assigning confirmable identifications to the entitled set. From the set, a subset is defined. That is, in accordance with various formats, acquired data is processed in statistical relationship, or in relation to applied external data to accomplish such functional operating formats as an auction sale, a contest, a lottery, a poll, a merchandising operation, a game, and so on.

A variety of memory techniques are used to selectively activate the voice origination apparatus. Accordingly, statistical analysis and selection can be effectively and economically accomplished with respect to a substantial set of callers who are accommodated individual communication through a telephone system.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, exemplary embodiments exhibiting various objectives and features hereof are set forth, specifically:

FIG. **1** is a block diagram of a system constructed in accordance with the present invention;

FIG. **2** is a fragmentary diagrammatic representation of a storage cell format as may be developed in the system of FIG. **1**;

FIG. **3** is a flow diagram of one operating format of the system of FIG. **1**;

FIG. **4** is a block diagram of a form of processor or function unit as may be employed in the system of FIG. **1**;

FIG. **5** is a fragmentary diagrammatic representation of a storage cell format as may be developed in the system of FIG. **1** with the processor of FIG. **4**;

FIG. **6** is a block diagram of elements in an operating function unit of FIG. **4**;

FIG. **7** is a diagrammatic representation of a storage cell format as may be developed in the system of FIG. **4**; and

FIG. **8** is a block diagram of elements in an operating function unit of FIG. **4**.

FIG. **9** is a block diagram of the connections between the CPU and remote stations.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS

As required, detailed illustrative embodiments of the present invention are disclosed herein. However, physical communication systems, data formats, and operating structures in accordance with the present invention may be embodied in a wide variety of forms, some of which may be quite different from those of the disclosed embodiments. Consequently, the specific structural and functional details disclosed herein are merely representative; yet in that regard, they are deemed to afford the best embodiments for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. **1**, a series of remote telephone-instrument terminals T1 through Tn are represented (left).

The terminals are generally similar, and accordingly, only the terminal T1 is illustrated in detail.

In the disclosed embodiment, the remote terminals T1 through Tn represent the multitude of conventional telephone terminals that are coupled to a communication facility C which may take the form of a comprehensive public telephone system for interconnecting any associated terminals T1–Tn. In accordance with the present system, the terminals T1–Tn operate through the communication facility C to be coupled with a central station D, an embodiment of which is illustrated in some detail.

Generally in accordance with the present development, individual callers use the individual telephone stations T1 through Tn to interface the station D through the communication facility C. Callers may be screened or qualified. Also in accordance herewith, the data of individual callers may be collected, correlated and tested in the station D for processing in accordance with various programs and external data. As a consequence, various objectives are accomplished. For example, a select subset of the callers may be isolated and specifically identified, or related data may be processed, or transactions may be actuated. The possibilities for application of the system are substantial and varied as will be apparent from the exemplary structure and functions as described in detail below.

In one operating process format, the public might be polled with regard to locating the specific purchasers of a defective or dangerous product. Alternatively, the public might be polled with the objective of locating persons susceptible to a specific ailment or disease. Public auctions of unprecedented participation are possible. Legal lotteries are enabled that are interesting, effective and very economical on an individual participant basis. The system also might be employed in various game formats or to automate a promotion or mail-order operation, even to the extent of including inventory control as detailed below.

In each functional operating format, the callers may be variously qualified on the basis of entitlement and may be identified for subsequent verification. The callers then may be prompted, either through the interface or externally, to provide appropriate data.

Considering the system of FIG. **1** in somewhat greater detail, it is to be understood that the communication facility C has multiplexing capability for individually coupling the terminals T1–Tn to the central station D on request. In the illustrative embodiment of the system, the communication facility C comprises a public telephone network and the individual terminals T1–Tn take the various forms of existing traditional or conventional telephone instruments.

The exemplary telephone terminal T1 is represented in some detail to include a hand piece **10** (microphone and earphone) and a panel **12** provided with a rectangular array of push buttons **14** in the conventional configuration. Of course, the hand piece **10** accommodates analog signals while the panel **12** is a digital apparatus. Generally in accordance herewith, the hand piece **10** serves to manifest analog signals vocally to the caller.

In accordance with conventional telephone practice, alphabetic and numeric designations are provided on the buttons **14**. For example, several of the buttons **14** carry three letters along with a decimal digit. Specifically, the button designated with the numeral "2" also carries the letters "A", "B" and "C". In that manner, the buttons **14** encompass the numerals "0–9", two symbols, and the alphabet except for the letters "Q" and "Z". Consequently, the buttons **14** accommodate the entry of decimal data, and to some extent alphabetic data.

The buttons **14** designated with symbols "*" and "#", along with the numeral "0", can be used by predetermined assignment to represent the letters "Q" and "Z" or any of a variety of other data or command components. Generally, in accordance herewith, the buttons **14** are employed to formulate digital data at the central station D in various formats determined by the instant specific use and operating format of the system.

Considering the central station D in somewhat greater detail, the communication facility C is coupled to interface a series of processing systems P1 through Pn (FIG. **1**, left). Specifically, the communication facility C is connected to the processing systems P1–Pn through an associated series of automatic call distributors AC1 through ACn. Each of the automatic call distributors AC1–ACn accommodates one hundred lines from the communication facility C and accordingly, may accommodate and queue up to 100 calls.

Each of the automatic call distributors AC1–ACn may take various forms as well know in the prior art, functioning to queue incoming calls for connection to a lesser number of lines. In the disclosed embodiment, from each of the call distributors AC1–ACn, fifty lines are connected respectively to the individual data processing systems P1–Pn through an interface **20** and a switch **21**. Thus, in the disclosed embodiment, each of the automatic call distributors AC1–ACn can accommodate one hundred lines, fifty of which may be active in association with one of the processing systems P.

The processing systems P1–Pn are similar, therefore, only the processing system P1 is shown in any detail. Collectively, the processing systems P1–Pn are interconnected with a command computer terminal CT, at least one interface terminal IT, at least one printer PR and an audio unit AD. The command terminal CT is separately coupled to the audio unit AD.

As represented, the processing systems P1 through Pn each contain a number of individual function units or processors PR1 through PRn. Although various other configurations and arrangements may be employed, the explanation is facilitated by including a plurality of individual function units as treated in detail below.

Considering the processing system P1, fifty lines from the automatic call distributor AC1 are connected to the interface **20**, an exemplary form of which may be a commercially available Centrum 9000 unit. The interface **20** incorporates modems, tone decoders, switching mechanisms, DNIS and ANI capability (call data analyzer **20***a*) along with voice interface capability. Note that the interface may actually perform analysis on data. However, to preserve the disclosed embodiment manageable, major analysis is explained with reference to processors.

Generally, DNIS capability is a function of the communication facility C (composite telephone system) to provide called terminal digital data indicating the called number. ANI capability is a similar function whereby the digital data indicates the calling number with calling terminal digital signals. Both capabilities are available for use with equipment as the interface **20** and to provide control through the call data analyzer **20***a*.

Accommodating up to fifty independent calls on separate communication paths to the central station D, the interface **20** is capable of providing analog (voice) signals to prompt each caller. Also accommodated are digital signals including the DNIS and ANI signals. The system contemplates the possibility of utilizing sequences of lines in rotary as well as blocking sequences of lines, the numbers for which com-

mand a particular program or operation format of a function unit as disclosed in detail below.

The interface **20** provides the connection of the fifty lines to a switch **21** which is in turn coupled to fifty function units, or processors PR1–PRn. As indicated above, multiple function units, or processors, are described in the disclosed embodiment to facilitate the explanation. Of course, non-parallel techniques and multiplexed operations might well be employed as alternatives. For a similar reason, as disclosed herein, each of the processors PR1–PRn includes memory cells for each of the callers' individual data. Development and compilation of data in such cells according to various operating formats is described below. In the disclosed embodiment, the processors PR1–PRn are connected collectively to the command computer terminal CT (incorporating a CRT display), the interface terminal IT, and the printer PR. Note that the CRT display serves to visually display data regarding select subsets as explained in detail below.

Exemplary detailed structures for the processors PR1–PRn are described below; however, in general, the units may comprise a microcomputer, for example, programmed as suggested above and as disclosed in detail below to accomplish specific operating formats. As an integral part of such formats, a caller may be qualified as belonging to an entitled set of persons or to accommodate specific demographic objectives. Also, callers may be designated both with respect to their significance and their identification. For example, callers may have different significance in a format, depending on the time or sequence of their call. Also, the designation of a caller may be exceedingly important in relation to the caller eventually being isolated as part of a subset, the members of whom must be accurately verified. As described below, the designations may involve multiple elements which may include: random number assignments, encryption techniques, utilization of calling numbers, identification data, sequence of call and so on to facilitate reliable verification. Note that the communication facility C has a customer billing structure B that is interfaced by the system.

On the qualification and designation of callers, the system enters a data accumulation phase during which digital data (formatted at one of the telephone terminals T1–Tn) is processed by one of the processors PR1–PRn. In general, the processing evolves a subset (at least one caller) the members of which may be verified and confirmed.

Either during the data accumulation phase, or after the processing phase to isolate a subset, a distinct operation may involve actuating the interface terminal T1 for direct local communication between the caller and an operator at the terminal T1. Another distinct operation may involve actuation of the printer PR to provide documents in relation to the operating format, as for providing award certificates as for verifying members of an isolated subset. Also, charge slips may be generated containing at least part of the data of a particular transaction.

An appreciation of the philosophical operation of a system in accordance with the present invention may now be enhanced by considering an exemplary operation of the illustrative embodiment of FIG. **1** to isolate a subset of people who are susceptible to a particular disease or infirmity. The exemplary operation might involve a geographical area, as a large city or population center, in which a particular health problem is somewhat acute. For example, a major population center might be polled where coronary artery disease is a significant problem. Accordingly, persons most susceptible to such disease could be identified for corrective recommendations.

People of the population center could be informed of the availability of a service for statistical health analysis. Accordingly, persons interested in their individual statistical situation would be motivated to utilize the service. Specifically, individual callers would use the remote terminals T1–Tn to contact the central station D through the communication facility C and thereby provide personal information that would enable a statistical analysis in relation to existing data so as to isolate and inform (either real time or batch basis) those persons statistically most likely to be in need of corrective measures. In such applications, it may be important that the caller's identity be subject to reliable verification. Other applications or programs also may present a critical need for positively verifiable identification to the extent that credit card numbers and/or personal identification numbers may be employed.

An exemplary operation of the system, with regard to a specific caller, will now be treated referring somewhat concurrently to FIGS. **1**, **2** and **3**. As indicated above, FIG. **2** indicates a data storage format for a memory cell in an exemplary processor PR and now will be considered with regard to an operating format in which data is composed for a caller. Pursuing the above example, assume the existence of a caller at the remote terminal T1 (telephone number (213) 627-2222) who wishes to pursue health-related information on the basis of statistical analysis. The caller lifts the hand piece **10** and in accordance with conventional techniques actuates the push buttons **14** to call for a select operating format, e.g. telephone number (213) 627-3333 and thereby establish communication through the facility C with a designated function unit in the central station D. Receiving the call signal, the automatic call distributor AC1 associates the called number ((213) 627-3333, rendered available using standard telephone DNIS techniques) through the interface **20** and the switch **21** to attain connection with the specific processor, e.g. the processor PR1 formatting the health-related program. Accordingly, the processor PR1 cooperates with the interface **20** to cue the interface **20** to operate as a voice generator.

The sequence of operations is represented to be initiated in FIG. **3** by the "enter" block **40** which is accordingly followed by a "cue voice generator" command block **42**. If the ANI equipment is not employed, the voice generator in the interface **20** formulates speech, a representative form of which might be: "Thank you for participating in the coronary artery disease statistical analysis. Please give us your telephone number by actuating the call buttons on your telephone instrument."

Acting on the instructions, the caller would push the buttons **14** in sequence to indicate his telephone number, e.g. "(213) 627-2222". Alternatively, the interface **20** can accept the calling number ((213) 627-2222) according to its provision by standard ANI equipment of the communication facility C.

The resulting data signals are communicated from the interface unit **20** (FIG. **1**) to the processor PR1 for testing the telephone number as valid or entitled. Essentially, the format of a proper number prompts production of a valid or "good" signal. The test is indicated by the block **44** (FIG. **3**). If the response is not valid or entitled, for example contains an inappropriate number of digits or has been used to a point of excess, the operation of block **46** is initiated again cuing the voice generator **30** (FIG. **1**). The voice generator accordingly instructs the caller, e.g.: "You have not entered a

proper telephone number. Please reenter your telephone number by pressing the appropriate call buttons." The caller is then allotted a predetermined period of time to make a proper entry with the consequence that the system moves to a test operation as indicated by the block **48** (FIG. **3**). Specifically, block **48** poses the query: "Is the second try good?"

If the caller is again unsuccessful, the system purges the record as indicated by the block **50** and the call is terminated as indicated by the block **52**. In an alternative mode, the processor PR**1** may abort the interface and couple the interface terminal IT for direct personal communication with the caller. The interchange would then proceed, person-to-person.

If the caller responds with a proper telephone number, the operation proceeds. Specifically, the system sequences to record the response of the proper telephone number as indicated by the block **45**. That is, the caller's telephone number is recorded in an assigned specific memory cell identified with the caller. The format of the cell C**1** is indicated in FIG. **2**. The first portion, section **53**, contains a form of identification data, i.e., the caller's telephone number, i.e. "(213) 627-2222".

Note that as explained above, if the second attempt to formulate a proper number is successful, as manifest by the block **48** (FIG. **3**), the response is recorded at that stage. In either case, exiting from the block **54** (FIG. **3**) invokes the next operation of again queuing the voice generator as indicated by the block **56**.

As an alternative format, if a selective-group polling operation is performed, or callers are otherwise to be cleared for entitlement as mentioned above, a caller may be qualified by providing a "one-time" key number. The processor PR**1** may incorporate a look-up table for proper key numbers which numbers may be coded using any of a wide variety of techniques. As a simple illustrative example, the key may comprise a precise number of digits that always total a particular numerical value.

The system proceeds after the caller is qualified. Specifically, the cue to the voice generator of the interface **20** (FIG. **1**) as represented by the block **56** produces a request for further information from the caller with further identification data and answer data. For example, the voice generator might request information by stating: "Please use the telephone buttons to indicate initials of your name."

The detailed operation is not represented in FIG. **3** as it is similar to the operation illustrated by the blocks **42** through **54**. However, again, a proper response is registered in the storage cell C**1** as illustrated in FIG. **2** by the number "53" also registered in the first section **53** of the cell.

The cycle of obtaining digital information from the caller next is repeated with respect to answer data, i.e. specific health data. For example, as illustrated in FIG. **2**, the next section **58** in the cell C**1** receives an accumulation of health data, including the caller's age, weight, . . . , pulse rate, and so on. Representative digital numbers are illustrated in FIG. **2**.

During the course of the telephonic communication, the processor PR**1** formulates identification data for the caller specifically including: the chronological sequence of the call, the assigned designation of the call, and a set of acknowledgment digits for the call. Such data identification is registered in the caller's assigned cell C**1** in accordance with the format of FIG. **2** being stored in sections **62**, **64** and **66**. Note that the data may be stored in a coded interrelationship. For example, the acknowledgment digits may be related to the call record sequence. In the illustrative example, the chronological order number of the caller is 4951. The acknowledge digits may be derived from the sequence number. For example, as illustrated, a coded relationship may be established by adding "two" to each of the individual record sequence digits. Considering the example numerically:

	4951
Adding without propagated carries:	2222
	6173

Note that the confirmation data as acknowledgement digits can be extremely important, as to communicate with an isolated member of a subset. For example, identification could be published or circulated, as by a television broadcast, then respondents checked by use of confirmation data that may be confidential.

Continuing with the above example, the call chronological sequence registered for the caller is 4951 as represented in the section **62** while the acknowledge digits are 6173 as registered in the section **66**. Additionally, the processor PR**1** develops an assigned designation number, e.g. designation "4951684", which is registered in the section **64**, the acknowledge code or digits, e.g. 6173, being registered in the section **66**. These values are formulated in accordance with conventional number techniques during the data acquisition phase. With the exemplary numerals formulated, the operation proceeds.

The processor PR**1** (FIG. **1**) cues the internal memory. That operation is indicated by the block **68** (FIG. **3**). Thus, the processor PR**1** fetches the call record sequence number, assigns a designation (if not previously assigned), and encodes the sequence number as the acknowledgment digits (if not previously accomplished). These operations are indicated by the block **70** (FIG. **3**).

Next, the processor PR**1** (FIG. **1**) cues the voice generator in the interface **20**, as indicated by the block **72** (FIG. **3**) to provide information to the caller. Specifically, for example, the voice generator in the interface **20** (FIG. **1**) might signal: "This transaction has been designated by the number 4951684, and is further identified by the acknowledgment digits 6173. Please make a record of these numbers as they will be repeated. Specifically, the designation number is 4951684. The acknowledgment digits are 6173. Please acknowledge this transaction by pressing your telephone buttons to indicate the acknowledge digits 6173." In various applications as those involving security, the order and acknowledgment of callers may be very important. Therefore, data for confirmation associated with the order is important.

The system next proceeds to the test mode as indicated by the block **76** (FIG. **3**). If the caller provides the correct acknowledgment digits, the data is confirmed in the record as indicated by the block **80** and is registered in the cell C**1** (FIG. **2**). Additionally, the voice generator is sequenced as indicated by the block **82** (FIG. **3**) to indicate the close of the communication and that the transaction is terminated as represented by the exit block **84**.

In the event-that a caller cannot confirm his acknowledgment digits, as indicated by the block **76**, a repeat operation is performed as indicated respectively by the blocks **86** and **88**. Specifically, the voice generator is queued for a second instructional message. In the event that the second attempt also fails, the data is purged and the call discounted as

indicated by block **90** and an exit block **92**. If the second try is successful (test block **88**), as indicated by the block **80**, the record is perfected as indicated above.

As a result of the likelihood of a large number of calls, as described above, data cells in the processors PR1–PRn (FIG. **1**) are developed with specific information indicative of a statistical sampling of the populace of concern. The data of that statistical sampling may be self-generating of specific conclusions with respect to a subset of individuals, and/or supplemental data to clearly manifest a significant subset. For example, the data may indicate a significant departure from an assumed normal characteristic. Such data, accumulated from the polling may be considered by logic comparisons in the computer **22** to select the subset of persons who should be isolated.

In addition to the self-generating conclusions available from the received data, the system may involve the introduction of external data. In the physical fitness example, such external data might take the form of national statistical data. In any event, the processing operation usually involves comparison testing which compares caller data from individual memory cells of the processors P1–Pn (FIG. **1**) with test data that is supplied through the command terminal CT.

In the above example, members of the public in general were invited to use the service. A number of alternatives exist which might well impact on the statistical analysis. For example, a list may be preserved by a use-rate calculator to implement a consumable key operation. That is, a user is qualified to a specific limited number of uses during a defined interval.

As another example, callers might be restricted to the purchasers of a specific product as a medical apparatus for measuring blood pressures, heart rates, or so on. In such situations, it will be apparent that the statistical data will be somewhat distorted from an average or normal sampling. Clearly, the processors P1–Pn can be programmed to take into account such considerations. In that regard, the processors might also verify identification data proffered by a caller. Such data might take the form of a credit card number or a personal identification number. Methods for verification of such numbers using computer techniques are discussed below.

As indicated above and detailed below, the system can be programmed or formatted for use in a variety of applications. Preliminary to considering exemplary forms of such applications, reference will now be made to FIG. **4** showing an exemplary structural form for the processors PR1–PRn. From the switch **21** (FIG. **1**) a pair of communication lines **90** and **91** are indicated in FIG. **4** (top left). The line **90** provides signals from a processing unit **92** while the line **91** provides signals to the processing unit **92** along with other components as represented in FIG. **4**. The separate lines **90** and **92** facilitate explanation.

The processing unit **92** may take the form of a minicomputer programmed to accommodate the functions of various applications, as disclosed in detail below. As indicated above, the system may utilize a plurality of independent function units or processing units, e.g., processing unit **92**, operating in a somewhat parallel configuration, or alternatively, a limited number of processors may be driven sequentially to accommodate the functional operations as described.

The input line **91** (upper left) is connected specifically to a qualification unit **93**, a sequencer **94** and a designation unit **96**, as well as the processing unit **92** as indicated above. The qualification unit qualifies access from a remote terminal T1–Tn to the processing unit **92** as described in detail below. In accordance with various applications or operating formats, the qualification unit **93**, the sequencer **94** and the designation unit **96** operate preliminarily with respect to individual callers. Generally, these units qualify or test callers for entitlement, develop a sequence-of-calls record and provide forms of designations for callers that may be authenticated. As described in detail below, the units function in sequence to accomplish such operations and accordingly are each individually connected to the processing unit **92** and a buffer storage **97**. Essentially, the buffer storage **97** is illustrated separately from the processing unit **92** along with the unit **93**, sequencer **94**, unit **96**, and so on, again in order to facilitate the explanation. Similarly illustrated are a memory **98** (with cells C1–Cn), a look-up table **103** and a clock **105**.

Considering the processor of FIG. **4** in further detail, the qualification unit **93** (upper left) is connected to a look-up table **99** and a use-rate calculator **100**. The designation unit **96** (top center) is connected to a random number generator **101** and an encryptor **102**.

In view of the above structural description of the system, consideration will now be given to certain specific applications in relation to the operation of the system. In that regard, the operation of the system will next be considered to automate a mail-order facility.

Assume that a caller at a terminal T1 (FIG. **1**) dials a specific number to identify a mail order interface with the system of FIG. **1**. For example, assume the telephone number "(213) 627-4444" for such an interface. Accordingly the caller dials the number at the remote terminal **T1**. As a result, the communication facility C couples the terminal **T1** through the automatic call distributor AC1, the interface **20** and the switch **21** to a select processor PR1 identified and programmed for a mail-order operating format. Note that the communication facility C provides the dialed number ("(213) 627-4444") to the processing system **P1** through well known telephonic equipment DNIS. Accordingly, a program is selected to execute the mail order interface.

As a preliminary action, a voice responder in the interface **20** might be cued by the processing unit to identify the mail-order house and indicate that the order will be taken by computer. Either before or after qualification, the caller might be advised that if he prefers to communicate directly with a person, or needs such contact at any point in the communication, he may accomplish it simply by pushing the asterisk button (*) at the terminal T1. Such action forms an abort signal that is detected by the processing unit **92** to transfer the communication to the interface terminal IT (FIG. **1**). Alternatively, the customer may be asked (by voice cue) to provide detailed information as name, address, etc. which is recorded for later processing.

After the preliminary information is supplied to a caller, the qualification phase is initiated. For example, the interface **20** might actuate the terminal **T1** to announce: "Please indicate the type of credit card you will use for your purchase by pushing the button number 'one' for Mastercharge, 'two' for . . . "

The caller's response, indicating a specific credit card, will be stored in a data cell; however, the data is developed initially in the buffer **97**. The format and data for the present example (in the buffer **97**) will be explained with reference to a storage block format **104** as illustrated in FIG. **5**. The first data block **130** accordingly registers a digit to indicate the card that will be used to support the caller's purchase.

Using voice prompt, the interface **20** next instructs the caller to use the telephone buttons to indicate his credit card

number and the expiration date of the card. That data is stored in the register **104**, specifically in the blocks **132** and **134** as illustrated in FIG. **5**.

Next, the caller is asked for his customer number, as it may appear on his catalog. That number is stored in a block **136** of the block format register **104**. Note that the caller may not be identified in the files of the mail-order house and in that event, the operation may be shifted to a manual operation to be continued through the interface terminal IT (FIG. **1**) as explained above. For a television-initiated mail-order transaction, other numerical codes might be employed as to key into broadcast schedules. For example, a code might be used to indicate program times and thereby enable evaluation of the productivity of such program times. Such operation may be performed during the designation-phase as described below.

To continue with the explanation of the automated format, assume that the customer has a file customer number and that it is stored in the block format register **104** along with his credit card number and expiration date. From that location, the data is checked by the qualification unit **93** (FIG. **4**) for propriety as part of the test or qualification phase of operation. The check or test is in two stages and both are performed during an interval designated t**1**, the qualification unit **93** operating under control of the processing unit **92**.

First, the data is verified as representing valid and proper data formats for the customer's number, the credit card number and expiration date. The second operation involves consulting a so-called negative list to assure that the identified card and customer's number have not been cancelled, as for example in the case of credit cards that have been lost or stolen. Detailed structure for such tests is described in the parent case from which this case continues and may be incorporated in the qualification unit **93**.

With the successful completion and verification of the preliminary data in the block format register **104**, the qualification phase of operation is concluded and the system next interfaces with the caller to acquire and process data for a specific order of merchandise. Note that in the mail-order operating format, the sequence of the call is not normally significant. However, the sequencer **94** may log the time during a period t**2** if deemed worthwhile.

Somewhat as described above in relation to the initial operating format (health poll), the voice generator in the interface **20** prompts the caller through a series of exchanges that load the storage block format register **104** with a merchandise order. Thus, as purchase items are confirmed, the register **104** is loaded as exemplified by the blocks **140** and **142**. The interchange continues until the customer indicates he does not wish to order any additional items. The system then operates the designation unit **96** (FIG. **4**) during the interval t**3** to develop and announce the acknowledgement digits as stored in the block **144** (FIG. **5**). The acknowledgement digits serve to identify the order both for the caller and the mail-order house. Accordingly, tracing is facilitated. The data (FIG. **5**) is then transferred from the buffer **97** (FIG. **4**) to a select memory cell C**1**–Cn.

During the next interval t**4**, the processing unit **92** (FIG. **4**) isolates data of the cells C**1**–Cn to facilitate the mail-order process. In that regard, the processor **92** may incorporate structure and processing techniques as disclosed in the parent case.

Of the wide variety of other operating formats and applications in accordance herewith, further examples will now be described with reference to the systems of FIGS. **1** and **4**. However, from a consideration of the operating formats treated below, it will be apparent that certain structural elements have reoccurring significance in the combination. Specifically, such elements include the structures: (1) utilizing the called number to select a specific operating format, (2) for screening or selecting callers who will be accepted-based on various criteria, (3) for designating callers in a manner to enable subsequent positive identification and (4) various processing aspects of the data manipulations including the provision of at least a portion of certain ID data provided directly from the telephone apparatus. With respect to the data processing, distinctive elemental features include the utilization of external data not available during the interval of gathering data, the utilization of an interrelationship between the composite data collected during a data acquisition period, and the operation of utilizing time or sequence of callers to accomplish a subset.

As the next illustrative operating format, an instant lottery system will be described. Accordingly, assume the existence of a legalized state lottery accommodated by the telephone system utilizing a pay-to-dial number ("(213) 976-xxxx") and restricted to a limited number of uses for defined intervals of time. For example, a person might be entitled to play the lottery a limited number of times or to the extent of a limited dollar value during a predetermined interval.

From the terminal T**1** (FIG. **1**) the caller would actuate the push buttons **14** to establish contact with the processing system P**1** coupling would be through the communication facility C, the automatic call distributor AC**1**, the interface **20** and the switch **21** as described in detail above. The initial operation then involves qualification of the caller to participate in the instant winner lottery. Again, ANI or caller interface techniques may be employed. If the caller is involved, the interface **20** is actuated by the qualification unit **93** during the operating interval t**1** to instruct the caller: "Please key in your telephone calling number". As indicated above, an alternative involves the system simply registering the calling number on the basis of its provision by ANI equipment.

In any event, after the caller's telephone number is registered, the instruction is given: "Participation in instant winner lottery is for persons over twenty-one years of age. Accordingly, please key in the year of your birth". A driver's license or credit card number may be similarly registered to confirm age. Alternatively, the combination of telephone number and date of birth could be used. In any event, the caller's data is registered and the qualification unit **93** then functions to test the data as provided. Specifically, the caller's telephone number is checked in a look-up table **99** to determine whether or not it is a proper and currently valid number for use in the lottery. Concurrently, the number is checked by the use-rate calculator to determine the number of times it has been used in excess of a predetermined number of calls or dollar value to participate in the lottery during a current interval of monitoring.

If the data indicates a qualified caller, the system proceeds to the next phase of designating the transaction. Note that the sequence is not significant in this operating format with the consequence that the interval t**2** and the operation of the sequencer **94** may be bypassed. Rather, the designation unit **96** operates during the interval t**3** to provide the caller with a designation for the current transaction and if applicable, updates the file as to current use or dollar value remaining for the caller's use. As explained above, the random generator **101** with or without the encryptor **102** may be employed to create an identification number which may include an encrypted form of the caller's telephone number. Accordingly, data for the transaction is established in the

buffer **97** then set in a cell of the memory **98** (FIG. **4**). Specifically, the completed data cell format might be as follows: Telephone No.—Birth Year—Designation—Random No.

The system next functions to generate the random number as indicated above which will then be tested against a series of other numbers to determine whether or not the caller is a winner. In that regard, elements in the processing unit **92** which accomplish the operation are illustrated in FIG. **6** which will now be considered in detail.

A random number generator **160** functions on command to provide a three-digit number. With the consummation of a call, the random number generator **160** is actuated to provide the caller's random number in a selected caller cell **162**. From that location, the caller's random number is compared with numbers from a register **164** by a comparator **166**. The numbers in the register **164** were previously passed through a gate **174** from the generator **160**. In the event of coincidence, the comparator provides an output "yes" signal to a line **168**. Conversely, the failure of coincidence prompts the comparator **166** to provide a "no" output to a line **170**. Essentially, a "yes" indicates a win while a "no" indicates the caller has lost.

The elements of FIG. **6** provide a random operating format to determine winners on a somewhat statistical basis; however, the system increases the probability with the passage of time when no win occurs. In that regard, at the outset of an operating cycle, the random number generator **160** provides a random number that is passed through the gate **174** to the register **164**. In the exemplary format, a three-digit number would be provided. At that stage, the caller's random number, from the cell **162**, would be compared with the single number in the register **164** by the comparator **166**. However, with the passage of time, calls are tallied or time is metered by a counter **178**. Accordingly, upon the attainment of a predetermined count, the gate **174** is again qualified to enter another number in the register **164**. Accordingly, an increasing set of numbers are held in the register **164** for comparison with each caller's number. Of course, the more numbers in the register **164**, the higher probability of a caller winning and that relationship depends upon the duration or number of calls since the last winner.

Either a win or a loss as indicated within the processing unit **92** (FIG. **4**) prompts the interface **20** to respond appropriately to the caller announcing his results. If there is a win, the designation may be reinforced and additional identification may be taken as explained above. Of course, if the prize simply involves a credit on the caller's telephone bill or his credit account, identification and designation become less critical considerations.

In the event of substantial awards to be claimed, the processing system P1 (FIG. **1**) may actuate the printer PR to produce a positive identification of the winner, which document may be redeemed only by the caller providing the assigned designation along with confirmation of his identification data.

Generally in relation to awards, the processing unit **92** may also utilize a random number format for determining the significance of awards. That is, a random number may be actuated to provide numerals from one through twenty, for example, the magnitude of the number generated for a caller indicating the significance of his award. Normally such information would be provided to the caller and registered in his memory cell.

With respect to memory cells generally, it is to be noted that actuated memory cells may be cleared for callers who are not winners. Accordingly, a limited number of memory cells store the subset of winners for subsequent confirmation processing and so on.

As another operating process format in accordance with the present invention, consider an auction sale. As disclosed herein, the auction format is associated with television as, for example, in the form of a cable channel for dedicated use during an interval of an auction sale.

Preliminarily, in accordance with the disclosed exemplary format, persons wishing to participate in the auction sale would make preliminary arrangements involving utilization of the system to establish authorization data for qualified bidders in cells C1–Cn of the memory **98** (FIG. **4**). In an alternative format, the bidders could simply be qualified immediately before bidding, as on the basis of a charge-card number or other identification.

Generally, it is contemplated that callers are coupled into the system only during the bidding on specific items of merchandise. Accordingly, some prequalification may be desirable to facilitate the rapid accumulation of a bidding group with the introduction of a unit of merchandise.

In accordance with the disclosed format, an auctioneer conducts the sale in a somewhat traditional manner, recognizing that he is interfacing a relatively large audience through the system of the present invention and with a television connection. Specifically, the auctioneer is cued as to audience reaction by a monitor incorporated in the command computer terminal CT (FIG. **1**). Essentially, the auctioneer is given an abstract or summary of the relative bidding as the auction progresses. In one format, the caller sees the auction on a television receiver. That is, the monitor may be covered by a television camera to inform the audience and particularly interested bidders. Consider the detailed steps of the operation.

As the auctioneer announces the next item for sale, it is televised to potentially interested bidders. In addition to being informed of the merchandise, potential bidders might also be reminded of the telephone number for participating in the auction. Accordingly, any interested person at a remote terminal T1–Tn may dial the auction number and obtain access to the processing systems P1–Pn. The caller would have a television set available, tuned for example to a cable channel.

Any preliminary qualification as indicated above will then be performed along with any appropriate designation. With regard to the designation, unless callers are identified as part of the qualification step, the designation unit **96** (FIG. **4**) assigns a limited-digit number to individual callers for use by the auctioneer interfacing the command computer and terminal CT. Further designation and sequencing as disclosed herein also constitute part of the process. To the extent that qualification and designation operations may be performed, the operations are performed as described above with reference to FIG. **4** by the qualification unit **93** and the designation unit **96**. Of course, any of the safeguards and limitations as described herein may be employed as deemed appropriate for an auction format.

After the preliminaries, the auctioneer initiates the bidding with respect to a particular item that is observed by the callers on a television receiver as through a cable channel. Note that the audio may be variously coordinated through the telephone communication facility C and the audio channel of the caller's television. In a simple format, after an introductory phase, communication to callers with respect to the bidding is provided through the television link. Alternatively, the audio unit AD (FIG. **1**) may be employed.

Essentially, the auctioneer initiates the bidding by stating an initial value for the opening bid. Callers are invited to bid by actuating the push buttons **14** (FIG. **1**). For example, the auctioneer may invite an initial bid of one hundred dollars asking callers to so bid by entering an asterisk (*) by punching the button so designated. In accordance with one operating format, cells in the memory **98** (FIG. **4**) are actuated to register the bidding number in identified relationship with several calls. Note that although a record may be desirable, it is not usually necessary to record all bids, particularly at initial bidding figures. In any event, the individual processing units, e.g. unit **92** in individual processors PR1–PRn are interconnected (FIG. **1**) and operate to select the final and key bids.

After attaining the initial bid, the auctioneer may invite further bidding by seeking a bid of two hundred dollars or any bid. Such a bid might be accomplished either by punching the asterisk button to attain the solicited bid, or by using number buttons to enter a different bid, e.g. two hundred fifty by buttons "2", "5" and "0". Again, cells of the memory **98** are actuated to record select bids (sequence) at the higher value.

The status of the bidding is presented to the auctioneer by the monitor of the command computer terminal CT (FIG. **1**). Specifically, the auctioneer is provided an indication of the number of bidders at each level. If a sizeable number of callers bid at a specific value, the auctioneer may wish to advance the price significantly for the next round of bidding. Thus, the auctioneer proceeds until a small group of remaining callers are addressed. Note that the display of the command terminal CT (FIG. **1**) may also inform the auctioneer of fresh bidders.

As the selection process proceeds, signals from the clock CL (FIG. **1**) are introduced to indicate the sequence of bidders. For example, assume the bidding has proceeded to a stage where only three bidders remain active. The auctioneer is informed by the command terminal CT of the order in which the callers made their bids. The sequence is also of record in the cells of the memory **78** (FIG. **4**) to indicate the sequence in the event that the final bid involves more than one caller. Of course, the first caller to respond with a bid would have priority in the purchase.

Normally at the conclusion of the bidding on a particular item, the contents of the cells in the memory **98** would be purged with only the final bidders being held in general memory within the processing unit **92**. Of course, it is important to maintain a record of back-up bidders in the event the sale is not consummated with respect to the first of the highest bidders. That is, a subset of the highest bidders is preserved for each item of merchandise in the event that the highest bidder fails to qualify or the sale otherwise cannot be consummated. Of course, a distinct advantage of the system is the ability to accommodate a vast auction participation group for items of substantial value and as a consequence the distillation of a subset of callers is exceedingly valuable information.

To consider another operating format in association with the television media, a system will now be described whereby television viewers participate on a real-time basis in a game show for prizes. The ability to involve television viewers in a program has the potential of expanding program interest along with the expanded participation.

Game shows in accordance herewith may take any of a wide variety of forms as several well known programs in which studio contestants compete for prizes. In utilizing the system of the present invention to involve remote participants, it may be desirable to preliminarily qualify and designate callers as explained above. Specifically, prior to participating in an actual game show, interested participants interface the system as depicted in FIG. **1**, and in the course of an exchange as described above, the qualification unit **93** and the designation unit **96** cooperate with the processing unit **92** to accomplish preliminary data on potential participants in cells of the memory **96**.

Various games will involve different screening processes and clearances. For example, a child's television game format may require parental clearance and in that regard written communication may be required for approvals. Such approval may require the assignment of a personal identification number to the child player as qualifying identification data.

As explained above, clearances may be perfected through the look-up table **99** (FIG. **4**) in association with-the qualification unit **93** or approvals through a consumable key step may be extended to incorporate functions of the processing unit **92** in association with the memory **98**. For example, if qualification simply involves a check-off operation, the look-up table **99** will normally be employed. However, in the case of preregistration for a participant, as in the case of the auction sale, the memory **98** is involved with the qualification unit **93** through the processing unit **92** to establish a data cell C1–Cn for each qualified participant. Thus, each potential participant to be qualified interfaces with the processing unit **92** during a preliminary interval of operation to provide data in one of the cells C1–CN to facilitate qualification for participation during a real-time game show.

At the time of the show, callers are qualified simply by reference to their assigned memory cell data for a verification. Thereafter, the caller's exchange information to supplement their data as with respect to the play which follows. Specifically for example, a caller might select a studio audience participant with whom the caller is to be allied. The interface operation may be essentially as described above wherein a voice generator in the interface **20** (FIG. **1**) provides signals which activate the remote telephone unit to speak the instruction: "If you wish to play with Player No. 1, please push button No. 1; if you wish to play with Player No. 2, please push button No. 2 . . . . and so on". The caller may also be instructed to indicate the extent of a wager. For example, "Push the number button indicating the points you wish to risk".

The participant data is stored in an assigned cell of the memory **98** (FIG. **4**) for the caller and as the game proceeds, the processing unit **92** tallies the caller's score. Scores are interrelated between individual processing units to actuate the terminal CT. Thus, individual accounting occurs for each of the calling participants on an on-line basis dependent upon the success of the studio players and their association with the callers. On-going accounting data may be provided at intervals or real time by the recorded voice to each contestant.

According to the described format, after an interval of play, the processing units, as the unit **92** (FIG. **4**), operate to isolate a subset of caller-players who have amassed the highest scores. Of course, various arrangements may be provided for awarding prizes to the select subset of winning callers.

The above format involves a real-time game show with an on-line operating format. A somewhat similar format involves nonreal-time operation and in that sense, callers may interface with the system of the present invention

before and after the show; however, not primarily during the show. Such a show might involve a quiz for callers based on their ability to perceive and remember occurrences within the show. Preregistration may be employed, however, is not essential. Rather, callers may call after the broadcast of a program. In that event, sequence or time clocking may be very important to limit or control individual interfaces to a specific time or geographic "window". That is, as suggested above, allocation-routing equipment and techniques may be employed in various of the formats to window callers. With the system, callers are screened or qualified at the time of a call, identified in a particular calling sequence, designated for identification and quiz answers are given for subsequent processing. Alternatively, players could participate by providing their credit card for billing or be billed through the "pay-to-dial" network. Consider an exemplary format.

A key to participation in the game show may involve the purchase of a particular product. For example, a person desiring to participate may purchase a product which carries a concealed key number. The number serves as a caller's key to participation in the game show.

In accordance with the disclosed operating format, after watching the broadcast of a television show (possibly a serial episode) the participant actuates the push buttons **14** at one of the remote terminals T1–Tn to accomplish an interface communication with the select operating format. For example, the caller may actuate the buttons **14** for the station number "277-7777" which identifies the game format of current description.

Assume responsive operation of the communication facility C to couple the caller through the automatic call distributor ACI to the interface **20**. Upon establishing a connection, the interface **20** receives the caller's telephone number through ANI equipment and a data cell in the memory **98** (FIG. **4**) is assigned to the caller. Specifically, for example, associative coupling is provided for the caller through the switch **21** (FIG. **1**) to the processor PR1 containing the memory **98** (FIG. **4**) and a cell C2 assigned to the caller. A block format **200** is illustrated in FIG. **7** indicating the data that is developed in the cell C2. At the outset, the caller's telephone number is stored in a section **201** followed by uses/month in section **202**.

Next, the caller is greeted and requested to give the key number entitling him to participate in the game show. The instruction constitutes an initial action to take place in an interval of qualifications during the time t1. The caller actuates the buttons **14** providing digital representations to the qualification unit **93** (FIG. **4**) and-the look-up table **99** is consulted. Note that the table **99** may be a large, shared unit that tabulates each of the key numbers and accounts for their use. If the caller has identified a proper key number, the process proceeds and the key number is accounted, i.e. incremented or decremented to the limit of use if any. Alternatively, a repeat information operation may be requested as described in detail above.

As a further check during the qualification stage, the use-rate calculator **100** may function to determine whether or not an excessive number of calls have originated from the designated number. Thus, consideration involves calls or value with reference to a predetermined period of time. Again, a shared calculator may be used or addressing may obtain selectivity on the basis of calling numbers. If a large number of calls have originated from a single telephone terminal, a fraudulent situation may be suggested. Assuming no such indication occurs, the number of uses is registered in a section **200** (FIG. **7**) and the operation proceeds from the interval t1 to interval t2.

During the interval t2, the sequencer **94** registers the precise time of the call in the buffer storage **97**, specifically in a section **204** as illustrated in FIG. **7**. With the entry of such data, the system passes from the operating interval t2 to t3.

The caller is next asked to identify himself in some specific manner. For example, the caller may simply be asked to provide the year of his birth. Alternatively, somewhat comprehensive information may be taken as in the form of drivers' license numbers, social security numbers and so on. Of course, such data may be employed for subsequent identification of the caller and, accordingly, is registered in the buffer storage **97** (FIG. **4**). Specifically, identification information is registered in section **206** of the block **200** as shown in FIG. **7**.

In addition to receiving identification information from a caller, the system assigns a designation to the caller. Specifically, the random number generator **101** (FIG. **4**) provides a number which may be encrypted along with other identification data as the caller's personal identification to provide a numerical designation that is registered in the storage **97**. Specifically, the designation is stored in a section **208** as illustrated in FIG. **7**. With the designation operation complete, the interval t3 terminates initiating the data accumulation phase which occurs during an operating interval t4.

At this juncture, operating elements within the processing unit **92** will be considered in relation to an explanation of the manner in which select questions are provided to a caller and his answers received and recorded for subsequent processing to determine winners.

Preliminarily, reference will be made to FIG. **8** showing elements involved in the operating format which are contained in the processing unit **92** (FIG. **4**) in association with the memory **98**. To avoid confusion, the elements identified in FIG. **8** are designated by fresh numerals.

To accommodate the exemplary operating format, a dramatic program might be recorded preparatory to the television broadcast. A substantial number of questions would then be formulated based on the dramatic program. For example, "How many people were present when the will was read?"

It is contemplated that the dramatic program would be broadcast to different geographical segments of the country during different time intervals. To accommodate the different time intervals, it is proposed to utilize different questions for each geographic segment. That is, the basic format can remain the same, only the questions change by time zone to avoid study and collaboration on questions as a result of time shifts. A question propounded to a Chicago caller should not be repeated to a Los Angeles caller. In any event, callers might be given three questions randomly drawn from a pool serving one geographic segment and three questions drawn from a different pool serving another geographic segment.

The signals for prompting a voice generator are registered in memory sections MS1 through MSn. Each of the memory sections MS1–MSn is served by an address input AI1–AIn respectively. Similarly, the address inputs AI1–AIn are instructed by random number generators NG1–NGn, in turn actuated by decoders DE1–DEn. Consider the operating sequence of the memory MS1 as an example.

The decoder DE1 is responsive to telephone calling numbers (provided by ANI equipment) indicative of a particular geographic area. Note, for example, that area code numbers afford an effective geographic classification of callers which is very useful in many formats or processes of statistical analysis in accordance herewith. Note that geo-

graphic (or other) classification in accordance herewith is also accomplished by the called numbers provided. Each of several television stations would solicit calls for different numbers as a result, either by DNIS or call channeling. Select processors would be reached through the interface units, e.g. interface **20** FIG. **1**. In operation, the decoder DE1 determines a call is from a specific geographic area and accordingly provides a signal to actuate the random number generator NG1. As a consequence, the random number generator NG1 provides a series of three random numbers in the form of addresses for the memory MS1. That is, the addresses may simply comprise three alphanumeric bits supplied to the address input AI1 to prompt the provision of three sets of voice generator signals for announcing the three questions in sequence. For example, the first question might be as suggested above: "Push the button on your telephone for the number of persons present in the room when the will was read".

The voice generator signals are supplied from the memory MS1 (within the processing unit **92**, FIG. **4**) to the interface **20** (FIG. **1**) which generates audio signals to actuate the caller's hand piece **10**. Accordingly, the caller is instructed to answer three questions, the responses being recorded in a section **210** of the data block **200** (FIG. **7**). Note that the clock **105** (FIG. **4**) may be utilized to limit the response period allowed each caller.

As indicated above, to accommodate broadcast of the program in a different time slot for a different geographic area, the decoder DEn (FIG. **8**) actuates the random number generator NGn to address the memory MSn to provide three different questions as a result of a random selection. Accordingly, within a time or times (perhaps limited and offset) after the conclusion of the program, a substantial number of callers are accounted for in cells of the memory **98** and similar units of the composite system. The cells indicate sequences of calling and also may contain billing data where appropriate. That is, pay-to-dial operations avoid the need for billing, yet it may still be made of record.

Subsequent to the data accumulation phase of operation, the processing unit **92** (and its equivalents) is actuated during an off-line processing interval to isolate the subset of callers correctly responding to the questions. In accordance with one format, the subset of successful callers may be reduced to a sub-subset as by a random computer "draw" to define a group of significant winners. That is, a random number generator may be employed as explained above.

As an alternative to subsequent processing, the system may inform callers of their success during the course of the interface telephone call. That is, callers might simply be informed by cuing the voice generator: "Your answers are correct and in accordance with the program game, you will now be entered in the sweepstakes draw for the prize. . . . " Thus, the format defines a subset then further selects a sub-subset of winners. In any of the various formats, the status of the analysis can be televised by selecting a camera focused on the interface terminal IT.

Still another operating format for the system takes the form of polling operations to determine opinion or facts. An illustrative form of the format is disclosed below again in association with a television broadcast.

Generally, the illustrative polling format is contemplated in association with a television broadcast addressing a matter of current interest as, for example, a political issue or election. A master of ceremonies propounds questions to a viewing audience, many of whom are on-line through an interface of a system of the present invention. The master of ceremonies or commentator instructs the callers who are regulated and controlled by the system of the present invention to provide digital data which the system processes to inform the commentator as with regard to subsets of callers. For example, the commentator may be statistically informed as to the numbers of callers holding specific views. Consider a specific exemplary operating format.

Assume the existence of a system in accordance with the present invention installed for use in association with a television broadcasting facility. Of course, various previous arrangements could be involved; however, according to one arrangement a commentator simply invites members of the viewing audience to call a specific number and express their views with respect to a specific issue. Callers located at terminals T1–Tn (FIG. **1**) activate the terminals to accomplish an interface with one of the processing systems P1–Pn as explained above. Note that the processor (or the interface **20** may involve operation of the qualification unit **93** (FIG. **4**) to prevent callers from loading the poll. That is, to prevent multiple calls from a single terminal that would distort a poll, the qualification unit **93** registers calls in association with the use-rate calculator **100**. Interfacing a specific processor, callers are screened by the qualification unit **93** (FIG. **4**). In such a poll, it may be important to control the sampling group on a statistical basis. For example, it may be desirable to limit callers from each of several geographic areas. Accordingly, by the use of ANI equipment, the caller's telephone number is provided to the qualification unit **93** during the preliminary interval t**1**, and a determination is performed with regard to the number of involved callers from the geographic area using the look-up table **99**. On attaining a full quota from a specific area, a subsequent caller may be informed that the lines are full. Alternatively, the caller may be requested to provide his telephone number for screening in the event ANI equipment is not available.

The caller may be requested to provide additional information so as to poll a balanced group. For example, a caller might be asked questions concerning age, political registration and so on by prompting the interface unit **20** to pose audio questions and testing the digital results through the qualification unit **93** as with reference to the look-up table **99**.

As indicated above, in the event that the broadcast television program is one of a series, it may be desirable to limit the extent of participation over a period of several programs. Accordingly, the use-rate calculator **100** (FIG. **4**) may be employed in association with the qualification unit **93**. That is, if a calling number has participated in a prior poll, it may be denied access for a subsequent poll or its data not counted. Such operation would involve the use-rate calculator **100** in association with the qualification unit **93** performing logic tests to actuate the voice generator of the interface **20** for providing an appropriate interchange with a caller.

With the screening or qualification of a select group of callers, the sequencer **94** (FIG. **4**) may or may not be involved to identify the order of callers. Also, the designation unit **96** may or may not be involved in view of the fact that for many polls there is little interest in subsequently identifying callers.

In the poll-format operation of the system, it is important to provide a capability of defining select intervals during which callers may provide data. In one arrangement, with the consummation of a communication interface between a caller and a processor unit, the audio of the television broadcast is keyed from the audio unit AD through the switch **21** (FIG. **1**) for communication to the caller.

With a multiplicity of callers in interface relationship with the processors PR1–PRn as function units, a polling question is stated, for example: "If you favor expanded trade with . . . at the tone press button one; if you do not, press button two".

To control the interval of polling, the command computer terminal CT (FIG. **1**) is actuated to enable the callers timely access to the processors.

At the expiration of a polling interval, the interfaces may be terminated or additional questions may be propounded. In any event, subsequent to the data-gathering phase, the bulk data is supplied to the command computer terminal CT incorporating computing facility to isolate subsets for communication by the broadcast. Accordingly, an effective on-line poll can be conducted with statistical sampling control and prompt display of responses.

As explained above, the arrangement of the function unit (or units) may be variously embodied in a single processor or many processors, depending on various considerations as time sharing, multiplexing, paralleling and so on. The systems as described above embody the components bulked together in one location. However, components of the system could be spaced apart geographically, using dedicated lines or polling techniques. An illustrative embodiment is shown in FIG. **9**.

Call distributors CD1–CDn are at different geographic locations along with associated interface units IA1–IAn and IB1–IBn. Each of the interface units, as unit IA1 is coupled to a central processor **251** as indicated by lines **252, 254, 256** and **258**. Each of the lines may take the form of a dedicated telephone line or a polling telephonic coupling.

In the operation of the system of FIG. **9**, the call distributors CD are coupled to a telephonic communication system and accordingly allow the interface units I to provide interface communication between the central processing unit **251** and a multitude of remote terminals T1–Tn as illustrated in FIG. **1**. With data accumulated in the cells, it may be variously down loaded as to a central processing station. Thus, the distributed-component system is capable of executing the various formats as explained above with reference to the illustrative structure.

In view of the above explanation of exemplary systems, it will be appreciated that other embodiments of the present invention may be employed in many applications to accumulate statistical data, process such data, and define subsets of callers of concern. While certain exemplary operations have been stated herein, and certain detailed structures have been disclosed, the appropriate scope hereof is deemed to be in accordance with the claims as set forth below.

What is claimed is:

1. A control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals comprises a telephonic instrument including a voice communication device, and a digital input device in the form of an array of alphabetic numeric buttons for providing caller data signals, said control system comprising:

a processor unit for processing said caller data signals supplied by individual callers actuating said remote terminals;

interface structure for interfacing said communication facility to said processor unit wherein said interface structure receives data signals prior to the close of communication with the caller, including called number data signals (DNIS) and calling number identification data signals automatically provided by said communication facility and said caller data signals developed by said remote terminals;

voice generator for providing prompts to said individual callers in response to which said individual callers provide said caller data signals, said caller data signals including caller qualification data for qualify callers;

qualification structure for qualifying said callers based on a test for a consumable key number provided by said callers as at least a portion of said caller qualification data and a further test for a limit of use during a single period of time; and

means for controlling said processor unit in accordance with said called number identification data signals (DNIS) to process at least certain of said caller data signals in accordance with a select format from a plurality of formats identified by said called number identification data signals (DNIS) said tests performed before processing of at least certain of said caller data signals in accordance with said select format.

2. A control system according to claim **1**, wherein at least certain of said individual callers at certain of said remote terminals are also subject to qualification based on said calling number identification data signals.

3. An analysis control system for controlling order of items for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals comprises a telephonic instrument including a voice communication device and a digital input device in the form of an array of alphabetic numeric buttons for providing data and wherein said communication facility has a capability to automatically provide terminal digital data, indicating a calling number, said analysis control system comprising:

interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication and including means to provide caller data signals representative of data relating to said individual callers provided from said remote terminals prior to the close of communication with the caller, including caller social security number identification data and said terminal digital data indicative of a calling telephone number;

record testing structure connected to receive and test said caller data signals including certain caller data signals indicative of said terminal digital data representative of a calling telephone number and said caller social security number identification data against previously stored terminal digital data and caller social security number identification data and a further test based on a single period of time, said tests conducted before processing of said caller data signals; and

analysis structure for processing said caller data signals including item number data for ordering particular items under control of said record testing structure.

4. An analysis control system according to claim **3**, wherein a caller further provides credit card number data.

5. An analysis control system according to claim **4**, wherein said caller further provides expiration data with respect to said credit card number data.

6. An analysis control system according to claim **5**, wherein said caller receives authorization on-line.

7. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals comprises a telephonic instrument including a voice communication device and digital input device in the form of an array of

alphabetic numeric buttons for providing data and wherein said communication facility has a capability to automatically provide terminal digital data, indicating a calling telephone number, said analysis control system comprising:

interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication and including means to provide caller data signals representative of data relating to said individual callers provided from said remote terminals prior to the close of communication with the caller, including caller personal identification data and said terminal digital data indicative of a calling telephone number;

record testing structure connected to receive and test said caller data signals indicative of said terminal digital data representative of said calling telephone number and said caller personal identification data against previously stored terminal digital data and caller personal identification data said record testing structure also conducting a test based on a consumable key number and a further test based on a limit on use during a single period of time, said test conducted before storage or analysis of data;

storage structure for storing certain of said data provided by said individual callers including item number data for ordering particular items; and

analysis structure for receiving and processing said caller data signals under control of said record testing structure.

8. An analysis control structure according to claim **7** wherein said callers further provide credit card number data as further identification.

9. An analysis control system according to claim **8**, wherein said individual callers further provide expiration data with respect to said credit card number data.

10. An analysis control system according to claim **9**, wherein said individual callers receive authorization on-line.

11. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals comprises a telephonic instrument including voice communication device and digital input device in the form of an array of alphabetic numeric buttons for providing data and wherein said communication facility has a capability to automatically provide terminal digital data, indicating a calling number, said analysis control system comprising:

interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication and including means to provide caller data signals representative of data relating to said individual callers developed by said remote terminals and said terminal digital data;

analysis structure for processing said caller data signals;

structure for controlling said analysis structure in accordance with said terminal digital data; and

qualification structure to test said caller data signals specifying a consumable participation key as provided from at least one of said remote terminals.

12. An analysis control system according to claim **11**, wherein said terminal digital data is checked against a credit verification file for unacceptable numbers.

* * * * *

EXHIBIT 19

US006148065A

United States Patent [19]

Katz

[11] Patent Number: 6,148,065

[45] Date of Patent: *Nov. 14, 2000

[54] **TELEPHONIC-INTERFACE STATISTICAL ANALYSIS SYSTEM**

[75] Inventor: **Ronald A. Katz**, Los Angeles, Calif.

[73] Assignee: **Ronald A. Katz Technology Licensing, L.P.**, Los Angeles, Calif.

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **09/006,274**

[22] Filed: **Jan. 13, 1998**

Related U.S. Application Data

[63] Continuation of application No. 08/473,320, Jun. 7, 1995, which is a continuation of application No. 07/335,923, Apr. 10, 1989, which is a continuation of application No. 07/194,258, May 16, 1988, Pat. No. 4,845,739, which is a continuation-in-part of application No. 07/018,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of application No. 06/753,299, Jul. 10, 1985, abandoned.

[51] **Int. Cl.**[7] **H04M 3/51**

[52] **U.S. Cl.** **379/88.2**; 379/127; 379/265

[58] **Field of Search** 379/67.1, 88.01, 379/88.22, 88.23, 88.24, 265, 267, 142, 127, 88.25, 88.26, 88.27, 88.2, 88.21, 266, 309

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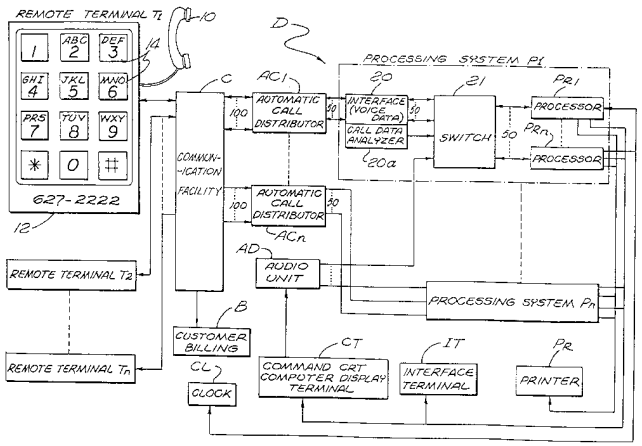
Attorney, Agent, or Firm—Lyon & Lyon LLP

[57] **ABSTRACT**

A system D interfaces with a multiplicity of individual terminals T1–Tn of a telephone network facility C, at the terminals callers are prompted by voice-generated instructions to provide digital data that is identified for positive association with a caller and is stored for processing. The caller's identification data is confirmed using various techniques and callers may be ranked and accounted for on the basis of entitlement; sequence or demographics. Callers are assigned random designations that are stored along with statistical and identification data. A break-off control circuit may terminate the computer interface aborting to a terminal for direct communication with an operator. Real-time operation processing is an alternative to stored data. The accumulation of stored data (statistical, calling order sequence, etc.) is variously processed and correlated as with developed or established data to isolate a select group or subset of callers who can be readily identified and reliably confirmed. Different program formats variously control the processing of statistical data as for auction sales, contests, lotteries, polls, commercials and so on.

13 Claims, 6 Drawing Sheets



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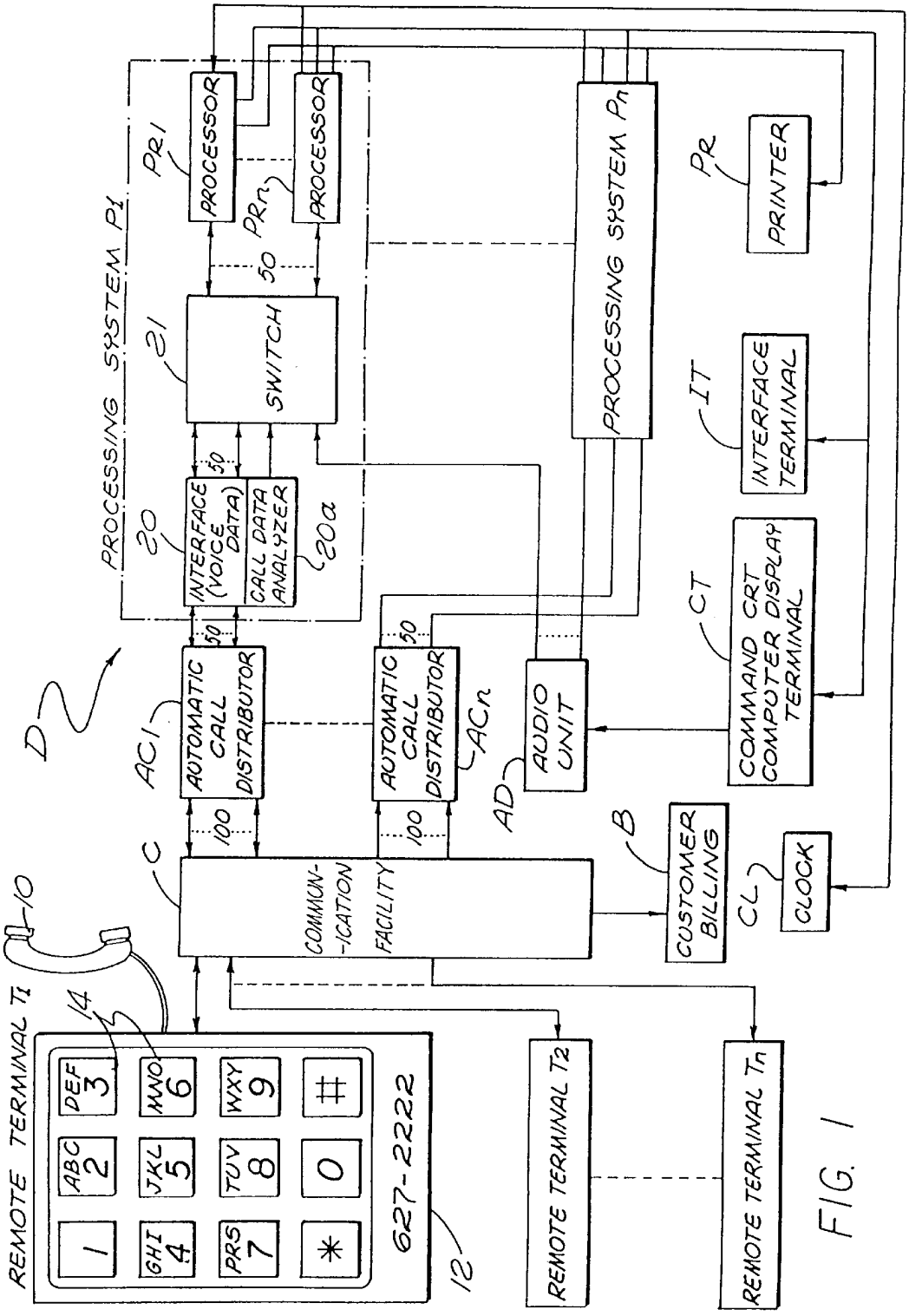

PROCESSING SYSTEM P1
PR1
PROCESSOR
PRn
PROCESSOR
50
21
SWITCH
50
20
INTERFACE (VOICE DATA)
CALL DATA ANALYZER
20a
50
50
D
AC1
AUTOMATIC CALL DISTRIBUTOR
AUTOMATIC CALL DISTRIBUTOR
ACn
100
100
C
COMMUN-ICATION FACILITY
10
REMOTE TERMINAL T1
14
DEF 3
MNO 6
WXY 9
#
ABC 2
JKL 5
TUV 8
0
1
GHI 4
PRS 7
*
627-2222
12
REMOTE TERMINAL T2
REMOTE TERMINAL Tn
PROCESSING SYSTEM Pn
AUDIO UNIT
AD
B
CUSTOMER BILLING
CL
CLOCK
PR
PRINTER
IT
INTERFACE TERMINAL
CT
COMMAND CRT COMPUTER DISPLAY TERMINAL

FIG. 1

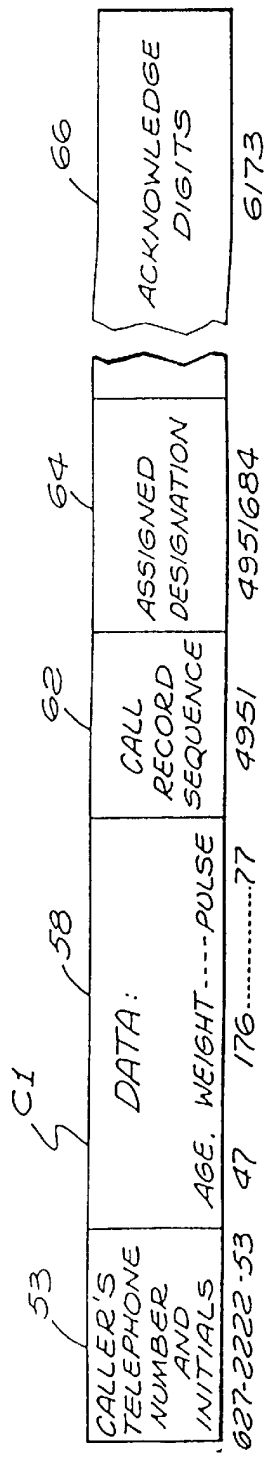


FIG. 2

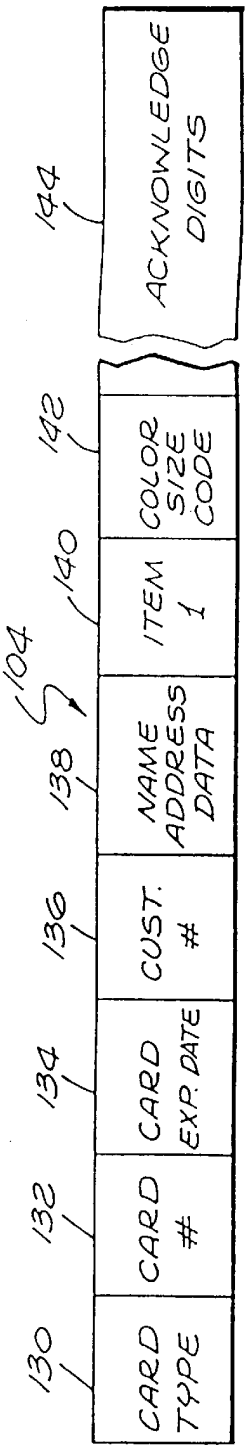


FIG. 5

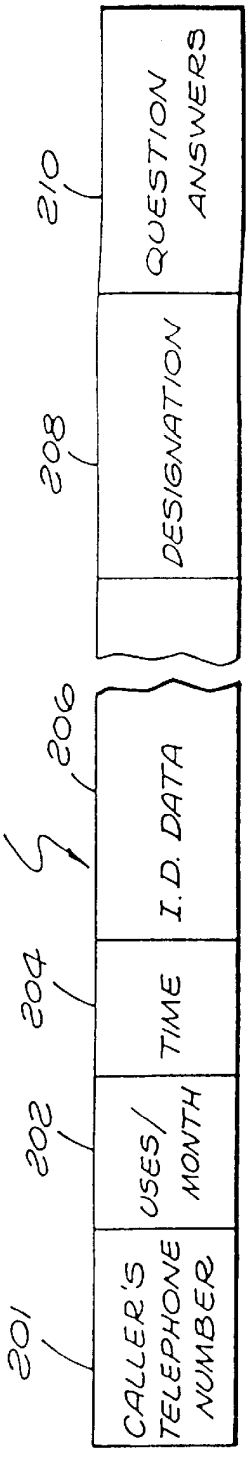


FIG. 7

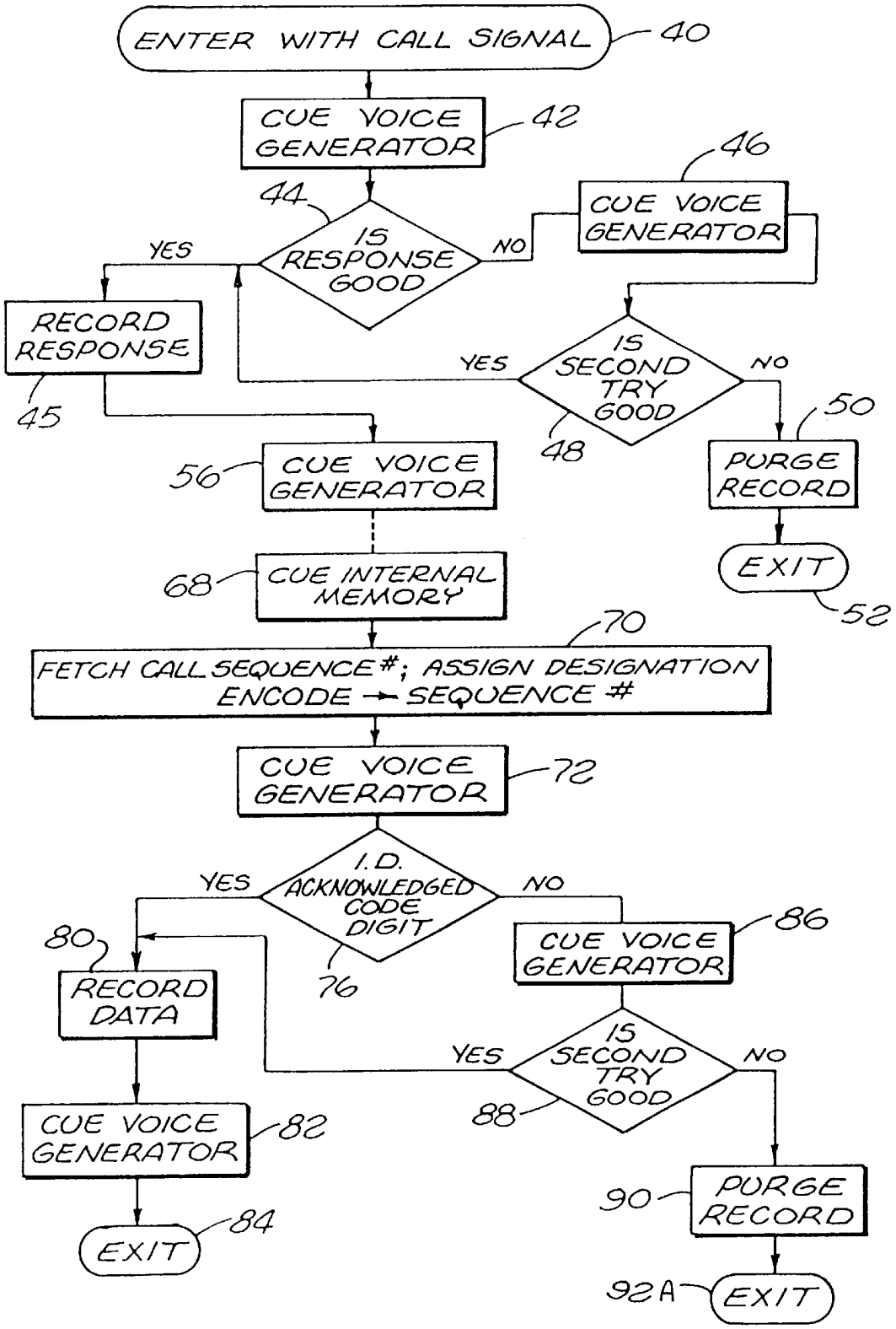

ENTER WITH CALL SIGNAL
40
CUE VOICE GENERATOR
42
44
IS RESPONSE GOOD
YES
NO
46
CUE VOICE GENERATOR
RECORD RESPONSE
45
IS SECOND TRY GOOD
YES
NO
48
50
PURGE RECORD
EXIT
52
56
CUE VOICE GENERATOR
68
CUE INTERNAL MEMORY
70
FETCH CALL SEQUENCE #; ASSIGN DESIGNATION ENCODE → SEQUENCE #
CUE VOICE GENERATOR
72
I.D. ACKNOWLEDGED CODE DIGIT
YES
NO
76
80
RECORD DATA
86
CUE VOICE GENERATOR
IS SECOND TRY GOOD
YES
NO
88
CUE VOICE GENERATOR
82
EXIT
84
90
PURGE RECORD
92A
EXIT

FIG. 3

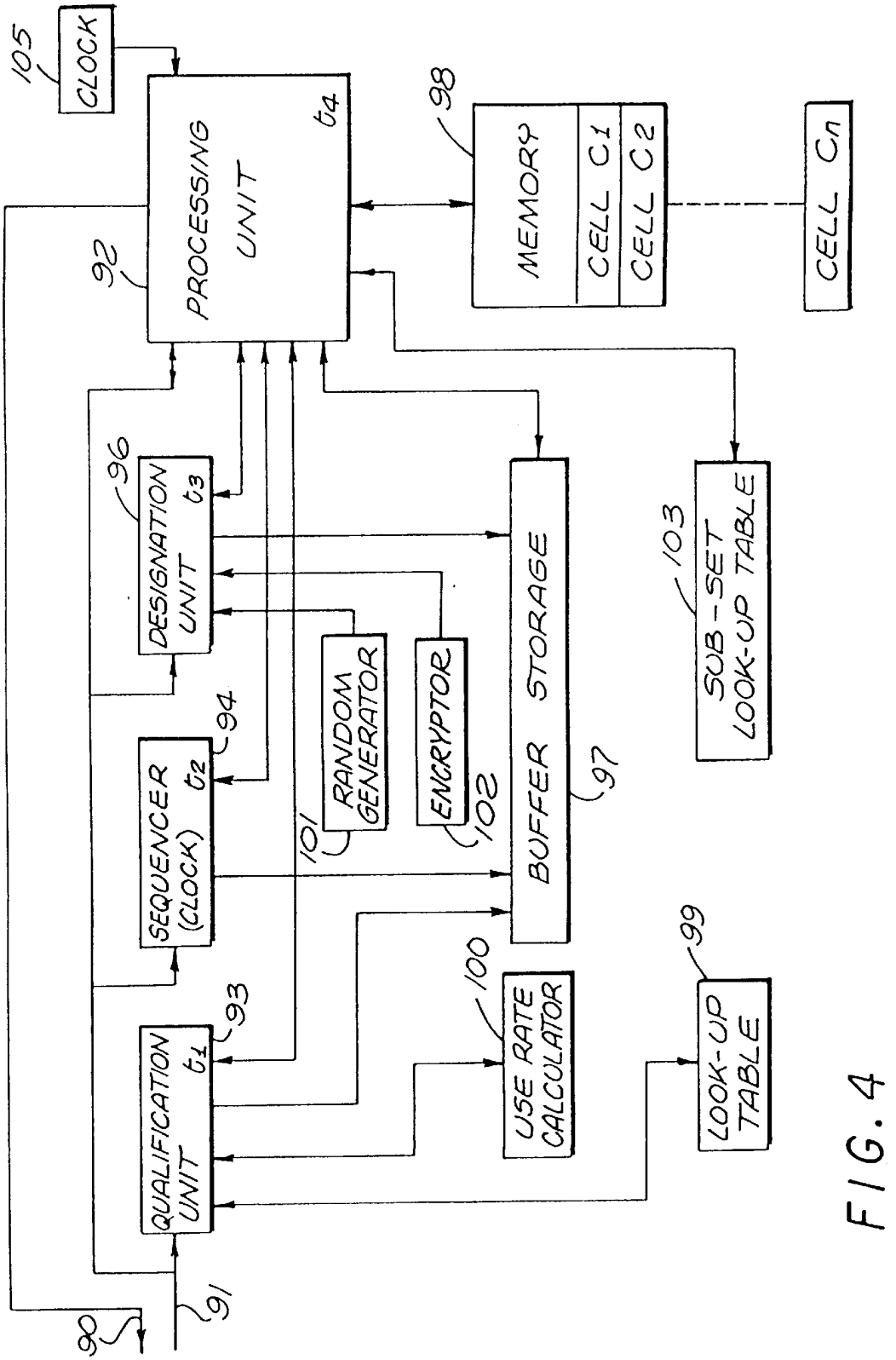

105
CLOCK
PROCESSING UNIT
t4
92
98
MEMORY
CELL C1
CELL C2
CELL Cn
96
DESIGNATION UNIT
t3
94
SEQUENCER (CLOCK)
t2
RANDOM GENERATOR
101
ENCRYPTOR
102
BUFFER STORAGE
97
103
SUB-SET LOOK-UP TABLE
93
QUALIFICATION UNIT
t1
100
USE RATE CALCULATOR
99
LOOK-UP TABLE
90
91

FIG. 4

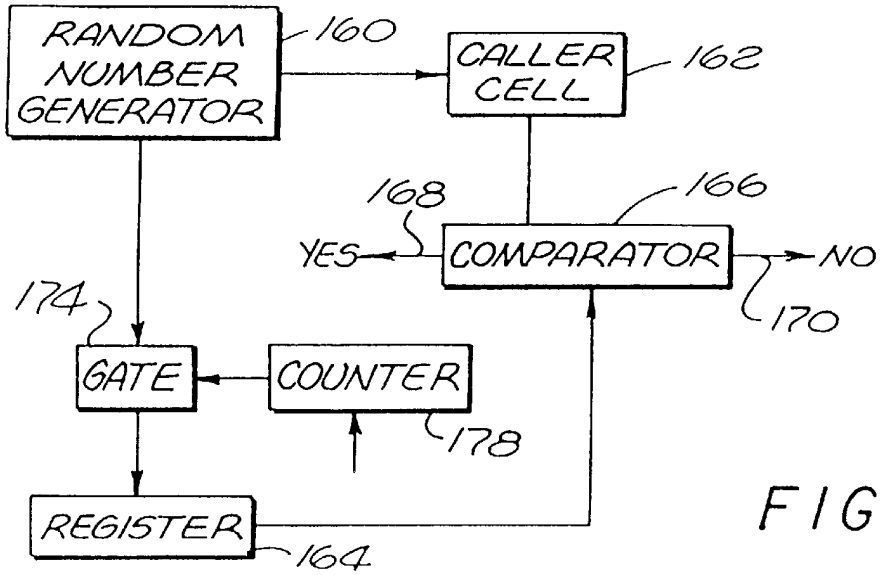
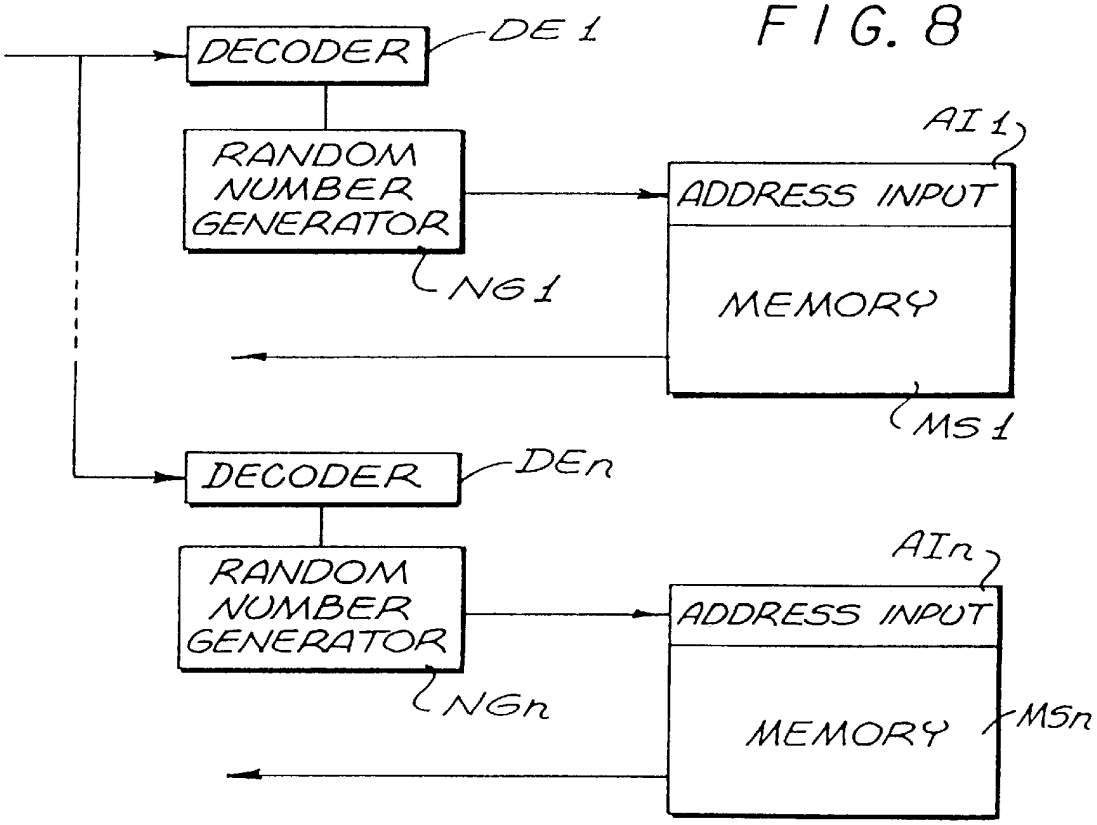

RANDOM NUMBER GENERATOR
160
CALLER CELL
162
168
166
YES
COMPARATOR
NO
170
174
GATE
COUNTER
178
REGISTER
164

FIG. 6

FIG. 8


DECODER
DE 1
AI 1
RANDOM NUMBER GENERATOR
ADDRESS INPUT
NG 1
MEMORY
MS 1
DECODER
DEn
AIn
RANDOM NUMBER GENERATOR
ADDRESS INPUT
NGn
MEMORY
MSn

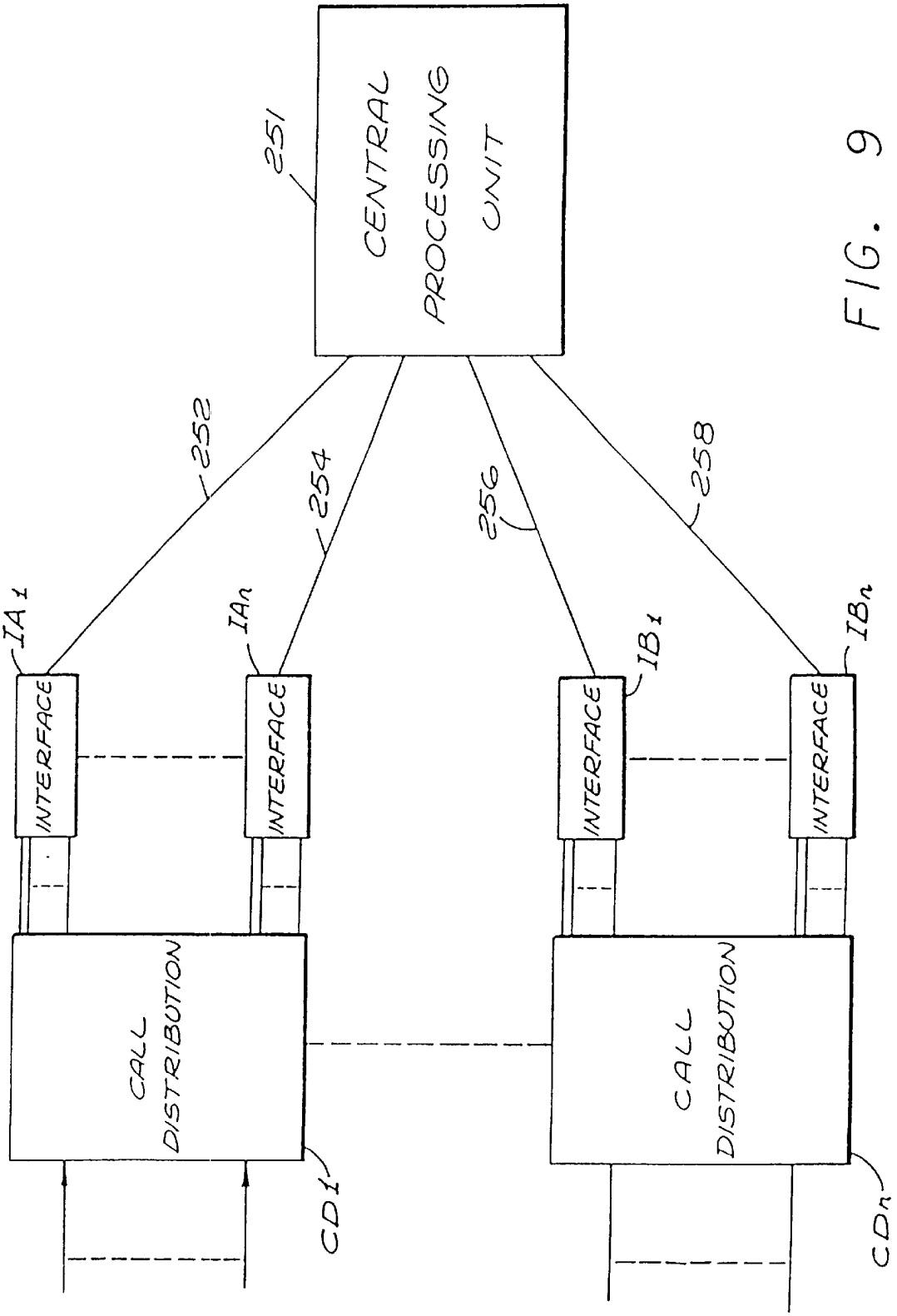

CENTRAL PROCESSING UNIT
251
252
254
256
258
IA 1
IAn
IB 1
IBn
INTERFACE
INTERFACE
INTERFACE
INTERFACE
CALL DISTRIBUTION
CALL DISTRIBUTION
CD 1
CDn

FIG. 9

TELEPHONIC-INTERFACE STATISTICAL ANALYSIS SYSTEM

This is a continuation application of application Ser. No. 08/473,320 filed Jun. 7, 1995, and entitled "Telephonic-Interface Statistical Analysis System", which is a continuation application of application Ser. No. 07/335,923 filed Apr. 10, 1989, and entitled "Telephonic-Interface Statistical Analysis System", which was a continuation of application Ser. No. 07/194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U.S. Pat. No. 4,845,739, which is a continuation-in-part of application Ser. No. 07/018,244 filed Feb. 24, 1987, and entitled "Statistical Analysis System For Use With Public Communication Facility," now U.S. Pat. No. 4,792,968, which was a continuation-in-part of application Ser. No. 06/753,299 filed Jul. 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility," now abandoned.

BACKGROUND AND SUMMARY OF THE INVENTION

Various forms of publicly accessible communication systems for providing access to a central station have been proposed, some involving telecommunications. However, sometimes a need for ancillary functions arise in that regard, e.g. it may be desirable to positively identify a large group of persons, as a demographically controlled group, or a specifically entitled group, then statistically analyze data from the group so as to accurately identify certain persons in the group and select a subset of at least one person. Specifically, it may be desirable to obtain medical data from an entitled group of people, to correlate such data, perhaps introduce external data, then identify a select subset of the group. In that regard, a need exists for an improved, effective, economical, and expedient system of telecommunication incorporating means for performing qualification, identification, analysis and selection of individual persons.

It has been proposed to interface persons at telephone calling stations directly with a computer facility. In accordance with such arrangements, recorded voice messages prompt callers to provide data by actuating the alphanumeric buttons that are conventionally employed for dialing from one telephone station to another. In one prior arrangement, a caller may actuate dialing buttons to selectively attain a communication channel or to address specific information in a computer. In another arrangement, dialing buttons may be actuated to specify a billing designation as for requested services. Generally, such systems are believed to have been somewhat limited in scope, often involving difficulties that are frustrating or confusing to a caller. Nevertheless, such techniques have been widely used to enhance and broaden communication.

In general, the present invention comprises a telephonic-interface system and related process for selectively utilizing both analog (voice) and digital telephonic communication in a variety of different interface formats or programs, as to select or qualify a set of callers, enable positive identification of at least certain of the callers in the set, acquire data from callers in the set, statistically analyze acquired data, as in combination and in association with external data (time independent), and accordingly to isolate a subset of the callers with verifiable identification. That is, the external data (separate from caller-provided data) may be introduced at any of a variety of different times in relation to the caller data.

For example, a voice origination apparatus may prompt individual callers who (after qualification) provide select digital data to develop a record for further processing either immediately, upon the evolution of a defined set of callers or upon the establishment of select external data. Thus, following a qualification phase, the information acquisition phase may be concurrent or consecutive with respect to the processing phase. When appropriate, abort capability allows a caller to remain "off hook" and go to analog (vocal) communication. The caller then interfaces directly with an operator. For example, as disclosed in detail below, the calling number (ANI) is provided by the communication facility, and may be registered to correlate data in relation to the callers.

The system of the present invention may qualify an entitled set of callers, then receive answer data in the course of the call and develop identification or designation data, sequence data and statistical data. The system may then provide data cells for storing individual data while assigning confirmable identifications to the entitled set. From the set, a subset is defined. That is, in accordance with various formats, acquired data is processed in statistical relationship, or in relation to applied external data to accomplish such functional operating formats as an auction sale, a contest, a lottery, a poll, a merchandising operation, a game, and so on.

A variety of memory techniques are used to selectively activate the voice origination apparatus. Accordingly, statistical analysis and selection can be effectively and economically accomplished with respect to a substantial set of callers who are accommodated individual communication through a telephone system.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, exemplary embodiments exhibiting various objectives and features hereof are set forth, specifically:

FIG. **1** is a block diagram of a system constructed in accordance with the present invention;

FIG. **2** is a fragmentary diagrammatic representation of a storage cell format as may be developed in the system of FIG. **1**;

FIG. **3** is a flow diagram of one operating format of the system of FIG. **1**;

FIG. **4** is a block diagram of a form of processor or function unit as may be employed in the system of FIG. **1**;

FIG. **5** is a fragmentary diagrammatic representation of a storage cell format as may be developed in the system of FIG. **1** with the processor of FIG. **4**;

FIG. **6** is a block diagram of elements in an operating function unit of FIG. **4**;

FIG. **7** is a diagrammatic representation of a storage cell format as may be developed in the system of FIG. **4**;

FIG. **8** is a block diagram of elements in an operating function unit of FIG. **4**; and

FIG. **9** is a block diagram of the connections between the CPU and remote stations.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS

As required, detailed illustrative embodiments of the present invention are disclosed herein. However, physical communication systems, data formats, and operating structures in accordance with the present invention may be embodied in a wide variety of forms, some of which may be

quite different from those of the disclosed embodiments. Consequently, the specific structural and functional details disclosed herein are merely representative; yet in that regard, they are deemed to afford the best embodiments for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. **1**, a series of remote telephone-instrument terminals T**1** through Tn are represented (left). The terminals are generally similar, and accordingly, only the terminal T**1** is illustrated in detail.

In the disclosed embodiment, the remote terminals T**1** through Tn represent the multitude of conventional telephone terminals that are coupled to a communication facility C which may take the form of a comprehensive public telephone system for interconnecting any associated terminals T**1**–Tn. In accordance with the present system, the terminals T**1**–Tn operate through the communication facility C to be coupled with a central station D, an embodiment of which is illustrated in some detail.

Generally in accordance with the present development, individual callers use the individual telephone stations T**1** through Tn to interface the station D through the communication facility C. Callers may be screened or qualified. Also in accordance herewith, the data of individual callers may be collected, correlated and tested in the station D for processing in accordance with various programs and external data. As a consequence, various objectives are accomplished. For example, a select subset of the callers may be isolated and specifically identified, or related data may be processed, or transactions may be actuated. The possibilities for application of the system are substantial and varied as will be apparent from the exemplary structure and functions as described in detail below.

In one operating process format, the public might be polled with regard to locating the specific purchasers of a defective or dangerous product. Alternatively, the public might be polled with the objective of locating persons susceptible to a specific ailment or disease. Public auctions of unprecedented participation are possible. Legal lotteries are enabled that are interesting, effective and very economical on an individual participant basis. The system also might be employed in various game formats or to automate a promotion or mail-order operation, even to the extent of including inventory control as detailed below.

In each functional operating format, the callers may be variously qualified on the basis of entitlement and may be identified for subsequent verification. The callers then may be prompted, either through the interface or externally, to provide appropriate data.

Considering the system of FIG. **1** in somewhat greater detail, it is to be understood that the communication facility C has multiplexing capability for individually coupling the terminals T**1**–Tn to the central station D on request. In the illustrative embodiment of the system, the communication facility C comprises a public telephone network and the individual terminals T**1**–Tn take the various forms of existing traditional or conventional telephone instruments.

The exemplary telephone terminal T**1** is represented in some detail to include a hand piece **10** (microphone and earphone) and a panel **12** provided with a rectangular array of push buttons **14** in the conventional configuration. Of course, the hand piece **10** accommodates analog signals while the panel **12** is a digital apparatus. Generally in accordance herewith, the hand piece **10** serves to manifest analog signals vocally to the caller.

In accordance with conventional telephone practice, alphabetic and numeric designations are provided on the buttons **14**. For example, several of the buttons **14** carry three letters along with a decimal digit. Specifically, the button designated with the numeral "2" also carries the letters "A", "B" and "C". In that manner, the buttons **14** encompass the numerals "0–9", two symbols, and the alphabet except for the letters "Q" and "Z". Consequently, the buttons **14** accommodate the entry of decimal data, and to some extent alphabetic data.

The buttons **14** designated with symbols "*" and "#", along with the numeral "0", can be used by predetermined assignment to represent the letters "Q" and "Z" or any of a variety of other data or command components. Generally, in accordance herewith, the buttons **14** are employed to formulate digital data at the central station D in various formats determined by the instant specific use and operating format of the system.

Considering the central station D in somewhat greater detail, the communication facility C is coupled to interface a series of processing systems P**1** through Pn (FIG. **1**, left). Specifically, the communication facility C is connected to the processing systems P**1**–Pn through an associated series of automatic call distributors AC**1** through ACn. Each of the automatic call distributors AC**1**–ACn accommodates one hundred lines from the communication facility C and accordingly, may accommodate and queue up to 100 calls.

Each of the automatic call distributors AC**1**–ACn may take various forms as well known in the prior art, functioning to queue incoming calls for connection to a lesser number of lines. In the disclosed embodiment, from each of the call distributors AC**1**–ACn, fifty lines are connected respectively to the individual data processing systems P**1**–Pn through an interface **20** and a switch **21**. Thus, in the disclosed embodiment, each of the automatic call distributors AC**1**–ACn can accommodate one hundred lines, fifty of which may be active in association with one of the processing systems P.

The processing systems P**1**–Pn are similar, therefore, only the processing system P**1** is shown in any detail. Collectively, the processing systems P**1**–Pn are interconnected with a command computer terminal CT, at least one interface terminal IT, at least one printer PR and an audio unit AD. The command terminal CT is separately coupled to the audio unit AD.

As represented, the processing systems P**1** through Pn each contain a number of individual function units or processors PR**1** through PRn. Although various other configurations and arrangements may be employed, the explanation is facilitated by including a plurality of individual function units as treated in detail below.

Considering the processing system P**1**, fifty lines from the automatic call distributor AC**1** are connected to the interface **20**, an exemplary form of which may be a commercially available Centrum, 9000 unit. The interface **20** incorporates modems, tone decoders, switching mechanisms, DNIS and ANI capability (call data analyzer **20***a*) along with voice interface capability. Note that the interface may actually perform analysis on data. However, to preserve the disclosed embodiment manageable, major analysis is explained with reference to processors.

Generally, DNIS capability is a function of the communication facility C (composite telephone system) to provide called terminal digital data indicating the called number. ANI capability is a similar function whereby the digital data indicates the calling number with calling terminal digital signals. Both capabilities are available for use with equipment as the interface **20** and to provide control through the call data analyzer **20***a*.

Accommodating up to fifty independent calls on separate communication paths to the central station D, the interface **20** is capable of providing analog (voice) signals to prompt each caller. Also accommodated are digital signals including the DNIS and ANI signals. The system contemplates the possibility of utilizing sequences of lines in rotary as well as blocking sequences of lines, the numbers for which command a particular program or operation format of a function unit as disclosed in detail below.

The interface **20** provides the connection of the fifty lines to a switch **21** which is in turn coupled to fifty function units, or processors PR1–PRn. As indicated above, multiple-function units, or processors, are described in the disclosed embodiment to facilitate the explanation. Of course, non-parallel techniques and multiplexed operations might well be employed as alternatives. For a similar reason, as disclosed herein, each of the processors PR1–PRn includes memory cells for each of the callers' individual data. Development and compilation of data in such cells according to various operating formats is described below. In the disclosed embodiment, the processors PR1–PRn are connected collectively to the command computer terminal CT (incorporating a CRT display), the interface terminal IT, and the printer PR. Note that the CRT display serves to visually display data regarding select subsets as explained in detail below.

Exemplary detailed structures for the processors PR1–PRn are described below; however, in general, the units may comprise a microcomputer, for example, programmed as suggested above and as disclosed in detail below to accomplish specific operating formats. As an integral part of such formats, a caller may be qualified as belonging to an entitled set of persons or to accommodate specific demographic objectives. Also, callers may be designated both with respect to their significance and their identification. For example, callers may have different significance in a format, depending on the time or sequence of their call. Also, the designation of a caller may be exceedingly important in relation to the caller eventually being isolated as part of a subset, the members of whom must be accurately verified. As described below, the designations may involve multiple elements which may include: random number assignments, encryption techniques, utilization of calling numbers, identification data, sequence of call and so on to facilitate reliable verification. Note that the communication facility C has a customer billing structure B that is interfaced by the system.

On the qualification and designation of callers, the system enters a data accumulation phase during which digital data (formatted at one of the telephone terminals T1–Tn) is processed by one of the processors PR1–PRn. In general, the processing evolves a subset (at least one caller) the members of which may be verified and confirmed.

Either during the data accumulation phase, or after the processing phase to isolate a subset, a distinct operation may involve actuating the interface terminal T1 for direct local communication between the caller and an operator at the terminal T1. Another distinct operation may involve actuation of the printer PR to provide documents in relation to the operating format, as for providing award certificates as for verifying members of an isolated subset. Also, charge slips may be generated containing at least part of the data of a particular transaction.

An appreciation of the philosophical operation of a system in accordance with the present invention may now be enhanced by considering an exemplary operation of the illustrative embodiment of FIG. **1** to isolate a subset of people who are susceptible to a particular disease or infirmity. The exemplary operation might involve a geographical area, as a large city or population center, in which a particular health problem is somewhat acute. For example, a major population center might be polled where coronary artery disease is a significant problem. Accordingly, persons most susceptible to such disease could be identified for corrective recommendations.

People of the population center could be informed of the availability of a service for statistical health analysis. Accordingly, persons interested in their individual statistical situation would be motivated to utilize the service. Specifically, individual callers would use the remote terminals T1–Tn to contact the central station D through the communication facility C and thereby provide personal information that would enable a statistical analysis in relation to existing data so as to isolate and inform (either real time or batch basis) those persons statistically most likely to be in need of corrective measures. In such applications, it may be important that the caller's identity be subject to reliable verification. Other applications or programs also may present a critical need for positively verifiable identification to the extent that credit card numbers and/or personal identification numbers may be employed.

An exemplary operation of the system, with regard to a specific caller, will now be treated referring somewhat concurrently to FIGS. **1**, **2** and **3**. As indicated above, FIG. **2** indicates a data storage format for a memory cell in an exemplary processor PR and now will be considered with regard to an operating format in which data is composed for a caller. Pursuing the above example, assume the existence of a caller at the remote terminal T1 (telephone number (213) 627-2222) who wishes to pursue health-related information on the basis of statistical analysis. The caller lifts the hand piece **10** and in accordance with conventional techniques actuates the push buttons **14** to call for a select operating format, e.g. telephone number (213) 627-3333 and thereby establish communication through the facility C with a designated function unit in the central station D. Receiving the call signal, the automatic call distributor AC1 associates the called number ((213) 627-3333, rendered available using standard telephone DNIS techniques) through the interface **20** and the switch **21** to attain connection with the specific processor, e.g. the processor PR1 formatting the health-related program. Accordingly, the processor PR1 cooperates with the interface **20** to cue the interface **20** to operate as a voice generator.

The sequence of operations is represented to be initiated in FIG. **3** by the "enter" block **40** which is accordingly followed by a "cue voice generator" command block **42**. If the ANI equipment is not employed, the voice generator in the interface **20** formulates speech, a representative form of which might be: "Thank you for participating in the coronary artery disease statistical analysis. Please give us your telephone number by actuating the call buttons on your telephone instrument."

Acting on the instructions, the caller would push the buttons **14** in sequence to indicate his telephone number, e.g. "(213) 627-2222". Alternatively, the interface **20** can accept the calling number ((213) 627-2222) according to its provision by standard ANI equipment of the communication facility C.

The resulting data signals are communicated from the interface unit **20** (FIG. **1**) to the processor PR1 for testing the telephone number as valid or entitled. Essentially, the format

of a proper number prompts production of a valid or "good" signal. The test is indicated by the block **44** (FIG. **3**). If the response is not valid or entitled, for example contains an inappropriate number of digits or has been used to a point of excess, the operation of block **46** is initiated again cuing the voice generator **30** (FIG. **1**). The voice generator accordingly instructs the caller, e.g.: "You have not entered a proper telephone number. Please reenter your telephone number by pressing the appropriate call buttons." The caller is then allotted a predetermined period of time to make a proper entry with the consequence that the system moves to a test operation as indicated by the block **48** (FIG. **3**). Specifically, block **48** poses the query: "Is the second try good?"

If the caller is again unsuccessful, the system purges the record as indicated by the block **50** and the call is terminated as indicated by the block **52**. In an alternative mode, the processor PR**1** may abort the interface and couple the interface terminal IT for direct personal communication with the caller. The interchange would then proceed, person-to-person.

If the caller responds with a proper telephone number, the operation proceeds. Specifically, the system sequences to record the response of the proper telephone number as indicated by the block **45**. That is, the caller's telephone number is recorded in an assigned specific memory cell identified with the caller. The format of the cell C**1** is indicated in FIG. **2**. The first portion, section **53**, contains a form of identification data, i.e., the caller's telephone number, i.e. "(213) 627-2222".

Note that as explained above, if the second attempt to formulate a proper number is successful, as manifest by the block **48** (FIG. **3**), the response is recorded at that stage. In either case, exiting from the block **54** (FIG. **3**) invokes the next operation of again queuing the voice generator as indicated by the block **56**.

As an alternative format, if a selective-group polling operation is performed, or callers are otherwise to be cleared for entitlement as mentioned above, a caller may be qualified by providing a "one-time" key number. The processor PR**1** may incorporate a look-up table for proper key numbers which numbers may be coded using any of a wide variety of techniques. As a simple illustrative example, the key may comprise a precise number of digits that always total a particular numerical value.

The system proceeds after the caller is qualified. Specifically, the cue to the voice generator of the interface **20** (FIG. **1**) as represented by the block **56** produces a request for further information from the caller with further identification data and answer data. For example, the voice generator might request information by stating: "Please use the telephone buttons to indicate initials of your name."

The detailed operation is not represented in FIG. **3** as it is similar to the operation illustrated by the blocks **42** through **54**. However, again, a proper response is registered in the storage cell C**1** as illustrated in FIG. **2** by the number "53" also registered in the first section **53** of the cell.

The cycle of obtaining digital information from the caller next is repeated with respect to answer data, i.e. specific health data. For example, as illustrated in FIG. **2**, the next section **58** in the cell C**1** receives an accumulation of health data, including the caller's age, weight, . . . , pulse rate, and so on. Representative digital numbers are illustrated in FIG. **2**.

During the course of the telephonic communication, the processor PR**1** formulates identification data for the caller specifically including: the chronological sequence of the call, the assigned designation of the call, and a set of acknowledgment digits for the call. Such data identification is registered in the caller's assigned cell C**1** in accordance with the format of FIG. **2** being stored in sections **62**, **64** and **66**. Note that the data may be stored in a coded interrelationship. For example, the acknowledgment digits may be related to the call record sequence. In the illustrative example, the chronological order number of the caller is 4951. The acknowledge digits may be derived from the sequence number. For example, as illustrated, a coded relationship may be established by adding "two" to each of the individual record sequence digits. Considering the example numerically:

Adding without propagated carries:	4951 2222
	6173

Note that the confirmation data as acknowledgment digits can be extremely important, as to communicate with an isolated member of a subset. For example, identification could be published or circulated, as by a television broadcast, then respondents checked by use of confirmation data that may be confidential.

Continuing with the above example, the call chronological sequence registered for the caller is 4951 as represented in the section **62** while the acknowledge digits are 6173 as registered in the section **66**. Additionally, the processor PR**1** develops an assigned designation number, e.g. designation "4951684", which is registered in the section **64**, the acknowledge code or digits, e.g. 6173, being registered in the section **66**. These values are formulated in accordance with conventional number techniques during the data acquisition phase. With the exemplary numerals formulated, the operation proceeds.

The processor PR**1** (FIG. **1**) cues the internal memory. That operation is indicated by the block **68** (FIG. **3**). Thus, the processor PR**1** fetches the call record sequence, number, assigns a designation (if not previously assigned), and encodes the sequence number as the acknowledgment digits (if not previously accomplished). These operations are indicated by the block **70** (FIG. **3**).

Next, the processor PR**1** (FIG. **1**) cues the voice generator in the interface **20**, as indicated by the block **72** (FIG. **3**) to provide information to the caller. Specifically, for example, the voice generator in the interface **20** (FIG. **1**) might signal: "This transaction has been designated by the number 4951684, and is further identified by the acknowledgment digits 6173. Please make a record of these numbers as they will be repeated. Specifically, the designation number is 4951684. The acknowledgment digits are 6173. Please acknowledge this transaction by pressing your telephone buttons to indicate the acknowledge digits "6173". In various applications as those involving security, the order and acknowledgment of callers may be very important. Therefore, data for confirmation associated with the order is important.

The system next proceeds to the test mode as indicated by the block **76** (FIG. **3**). If the caller provides the correct acknowledgment digits, the data is confirmed in the record as indicated by the block **80** and is registered in the cell C**1** (FIG. **2**). Additionally, the voice generator is sequenced as indicated by the block **82** (FIG. **3**) to indicate the close of the

communication and that the transaction is terminated as represented by the exit block **84**.

In the event that a caller cannot confirm his acknowledgment digits, as indicated by the block **76**, a repeat operation is performed as indicated respectively by the blocks **86** and **88**. Specifically, the voice generator is queued for a second instructional message. In the event that the second attempt also fails, the data is purged and the call discounted as indicated by block **90** and an exit block **92**. If the second try is successful (test block **88**), as indicated by the block **80**, the record is perfected as indicated above.

As a result of the likelihood of a large number of calls, as described above, data cells in the processors PR1–PRn (FIG. **1**) are developed with specific information indicative of a statistical sampling of the populace of concern. The data of that statistical sampling may be self-generating of specific conclusions with respect to a subset of individuals, and/or supplemental data to clearly manifest a significant subset. For example, the data may indicate a significant departure from an assumed normal characteristic. Such data, accumulated from the polling may be considered by logic comparisons in the computer **22** to select the subset of persons who should be isolated.

In addition to the self-generating conclusions available from the received data, the system may involve the introduction of external data. In the physical fitness example, such external data might take the form of national statistical data. In any event, the processing operation usually involves comparison testing which compares caller data from individual memory cells of the processors P1–Pn (FIG. **1**) with test data that is supplied through the command terminal CT.

In the above example, members of the public in general were invited to use the service. A number of alternatives exist which might well impact on the statistical analysis. For, example, a list may be preserved by a use-rate calculator to implement a consumable key operation. That is, a user is qualified to a specific limited number of uses during a defined interval.

As another example, callers might be restricted to the purchasers of a specific product as a medical apparatus for measuring blood pressures, heart rates, or so on. In such situations, it will be apparent that the statistical data will be somewhat distorted from an average or normal sampling. Clearly, the processors P1–Pn can be programmed to take into account such considerations. In that regard, the processors might also verify identification data proffered by a caller. Such data might take the form of a credit card number or a personal identification number. Methods for verification of such numbers using computer techniques are discussed below.

As indicated above and detailed below, the system can be programmed or formatted for use in a variety of applications. Preliminary to considering exemplary forms of such applications, reference will now be made to FIG. **4** showing an exemplary structural form for the processors PR1–PRn. From the switch **21** (FIG. **1**) a pair of communication lines **90** and **91** are indicated in FIG. **4** (top left). The line **90** provides signals from a processing unit **92** while the line **91** provides signals to the processing unit **92** along with other components as represented in FIG. **4**. The separate lines **90** and **92** facilitate explanation.

The processing unit **92** may take the form of a minicomputer programmed to accommodate the functions of various applications, as disclosed in detail below. As indicated above, the system may utilize a plurality of independent function units or processing units, e.g., processing unit **92**, operating in a somewhat parallel configuration, or alternatively, a limited number of processors may be driven sequentially to accommodate the functional operations as described.

The input line **91** (upper left) is connected specifically to a qualification unit **93**, a sequencer **94** and a designation unit **96**, as well as the processing unit **92** as indicated above. The qualification unit qualifies access from a remote terminal T1–Tn to the processing unit **92** as described in detail below. In accordance with various applications or operating formats, the qualification unit **93**, the sequencer **94** and the designation unit **96** operate preliminarily with respect to individual callers. Generally, these units qualify or test callers for entitlement, develop a sequence-of-calls record and provide forms of designations for callers that may be authenticated. As described in detail below, the units function in sequence to accomplish such operations and accordingly are each individually connected to the processing unit **92** and a buffer storage **97**. Essentially, the buffer storage **97** is illustrated separately from the processing unit **92** along with the unit **93**, sequencer **94**, unit **96**, and so on, again in order to facilitate the explanation. Similarly illustrated are a memory **98** (with cells C1–Cn), a look-up table **103** and a clock **105**.

Considering the processor of FIG. **4** in further detail, the qualification unit **93** (upper left) is connected to a look-up table **99** and a use-rate calculator **100**. The designation unit **96** (top center) is connected to a random number generator **101** and an encryptor **102**.

In view of the above structural description of the system, consideration will now be given to certain specific applications in relation to the operation of the system. In that regard, the operation of the system will next be considered to automate a mail-order facility.

Assume that a caller at a terminal T1 (FIG. **1**) dials a specific number to identify a mail order interface with the system of FIG. **1**. For example, assume the telephone number "(213) 627-4444" for such an interface. Accordingly the caller dials the number at the remote terminal T1. As a result, the communication facility C couples the terminal T1 through the automatic call distributor AC1, the interface **20** and the switch **21** to a select processor PR1 identified and programmed for a mail-order operating format. Note that the communication facility C provides the dialed number ("(213) 627-4444") to the processing system P1 through well known telephonic equipment DNIS. Accordingly, a program is selected to execute the mail order interface.

As a preliminary action, a voice responder in the interface **20** might be cued by the processing unit to identify the mail-order house and indicate that the order will be taken by computer. Either before or after qualification, the caller might be advised that if he prefers to communicate directly with a person, or needs such contact at any point in the communication, he may accomplish it simply by pushing the asterisk button (*) at the terminal T1. Such action forms an abort signal that is detected by the processing unit **92** to transfer the communication to the interface terminal IT (FIG. **1**). Alternatively, the customer may be asked by the voice generator to provide (by voice) detailed information as name, address, etc. which is recorded for later processing.

After the preliminary information is supplied to a caller, the qualification phase is initiated. For example, the interface **20** might actuate the terminal T1 to announce: "Please indicate the type of credit card you will use for your purchase by pushing the button number 'one' for Mastercharge, 'two' for- . . . "

The caller's response, indicating a specific credit card, will be stored in a data cell; however, the data is developed initially in the buffer **97**. The format and data for the present example (in the buffer **97**) will be explained with reference to a storage block format **104** as illustrated in FIG. **5**. The first data block **130** accordingly registers a digit to indicate the card that will be used to support the caller's purchase.

Using voice prompt, the interface **20** next instructs the caller to use the telephone buttons to indicate his credit card number and the expiration date of the card. That data is stored in the register **104**, specifically in the blocks **132** and **134** as illustrated in FIG. **5**.

Next, the caller is asked for his customer number, as it may appear on his catalog. That number is stored in a block **136** of the block format register **104**. Note that the caller may not be identified in the files of the mail-order house and in that event, the operation may be shifted to a manual operation to be continued through the interface terminal IT (FIG. **1**) as explained above. For a television-initiated mail-order transaction, other numerical codes might be employed as to key into broadcast schedules. For example, a code might be used to indicate program times and thereby enable evaluation of the productivity of such program times. Such operation may be performed during the designation phase as described below.

To continue with the explanation of the automated format, assume that the customer has a file customer number and that it is stored in the block format register **104** along with his credit card number and expiration date. From that location, the data is checked by the qualification unit **93** (FIG. **4**) for propriety as part of the test or qualification phase of operation. The check or test is in two stages and both are performed during an interval designated t**1**, the qualification unit **93** operating under control of the processing unit **92**.

First, the data is verified as representing valid and proper data formats for the customer's number, the credit card number and expiration date. The second operation involves consulting a so-called negative list to assure that the identified card and customer's number have not been canceled, as for example in the case of credit cards that have been lost or stolen. Detailed structure for such tests is described in the parent case from which this case continues and may be incorporated in the qualification unit **93**.

With the successful completion and verification of the preliminary data in the block format register **104**, the qualification phase of operation is concluded and the system next interfaces with the caller to acquire and process data for a specific order of merchandise. Note that in the mail-order operating format, the sequence of the call is not normally significant. However, the sequencer **94** may log the time during a period t**2** if deemed worthwhile.

Somewhat as described above in relation to the initial operating format (health poll), the voice generator in the interface **20** prompts the caller through a series of exchanges that load the storage block format register **104** with a merchandise order. Thus, as purchase items are confirmed, the register **104** is loaded as exemplified by the blocks **140** and **142**. The interchange continues until the customer indicates he does not wish to order any additional items. The system then operates the designation unit **96** (FIG. **4**) during the interval t**3** to develop and announce the acknowledgment digits as stored in the block **144** (FIG. **5**). The acknowledgment digits serve to identify the order both for the caller and the mail-order house. Accordingly, tracing is facilitated. The data (FIG. **5**) is then transferred from the buffer **97** (FIG. **4**) to a select memory cell C**1**–Cn.

During the next interval t**4**, the processing unit **92** (FIG. **4**) isolates data of the cells C**1**–Cn to facilitate the mail-order process. In that regard, the processor **92** may incorporate structure and processing techniques as disclosed in the parent case.

Of the wide variety of other operating formats and applications in accordance herewith, further examples will now be described with reference to the systems of FIGS. **1** and **4**. However, from a consideration of the operating formats treated below, it will be apparent that certain structural elements have reoccurring significance in the combination. Specifically, such elements include the structures: (1) utilizing the called number to select a specific operating format, (2) for screening or selecting callers who will be accepted based on various criteria, (3) for designating callers in a manner to enable subsequent positive identification and (4) various processing aspects of the data manipulations including the provision of at least a portion of certain ID data provided directly from the telephone apparatus. With respect to the data processing, distinctive elemental features include the utilization of external data not available during the interval of gathering data, the utilization of an interrelationship between the composite data collected during a data acquisition period, and the operation of utilizing time or sequence of callers to accomplish a subset.

As the next illustrative operating format, an instant lottery system will be described. Accordingly, assume the existence of a legalized state lottery accommodated by the telephone system utilizing a pay-to-dial number ("(213) 976-xxxx") and restricted to a limited number of uses for defined intervals of time. For example, a person might be entitled to play the lottery a limited number of times or to the extent of a limited dollar value during a predetermined interval.

From the terminal T**1** (FIG. **1**) the caller would actuate the push buttons **14** to establish contact with the processing system P**1** coupling would be through the communication facility C, the automatic call distributor AC**1**, the interface **20** and the switch **21** as described in detail above. The initial operation then involves qualification of the caller to participate in the instant winner lottery. Again, ANI or caller interface techniques may be employed. If the caller is involved, the interface **20** is actuated by the qualification unit **93** during the operating interval tl to instruct the caller: "Please key in your telephone calling number". As indicated above, an alternative involves the system simply registering the calling number on the basis of its provision by ANI equipment.

In any event, after the caller's telephone number is registered, the instruction is given: "Participation in instant winner lottery is for persons over twenty-one years of age. Accordingly, please key in the year of your birth". A driver's license or credit card number may be similarly registered to confirm age. Alternatively, the combination of telephone number and date of birth could be used. In any event, the caller's data is registered and the qualification unit **93** then functions to test the data as provided. Specifically, the caller's telephone number is checked in a look-up table **99** to determine whether or not it is a proper and currently a valid number for use in the lottery. Concurrently, the number is checked by the use-rate calculator **100** to determine the number of times it has been used in excess of a predetermined number of calls or dollar value to participate in the lottery during a current interval of monitoring.

If the data indicates a qualified caller, the system proceeds to the next phase of designating the transaction. Note that the sequence is not significant in this operating format with the

consequence that the interval t2 and the operation of the sequencer **94** may be bypassed. Rather, the designation unit **96** operates during the interval t3 to provide the caller with a designation for the current transaction and if applicable, updates the file as to current use or dollar value remaining for the caller's use. As explained above, the random generator **101** with or without the encryptor **102** may be employed to create an identification number which may include an encrypted form of the caller's telephone number. Accordingly, data for the transaction is established in the buffer **97** then set in a cell of the memory **98** (FIG. **4**). Specifically, the completed data cell format might be as follows: Telephone No.—Birth Year—Designation—Random No.

The system next functions to generate the random number as indicated above which will then be tested against a series of other numbers to determine whether or not the caller is a winner. In that regard, elements in the processing unit **92** which accomplish the operation are illustrated in FIG. **6** which will now be considered in detail.

A random number generator **160** functions on command to provide a three-digit number. With the consummation of a call, the random number generator **160** is actuated to provide the caller's random number in a selected caller cell **162**. From that location, the caller's random number is compared with numbers from a register **164** by a comparator **166**. The numbers in the register **164** were previously passed through a gate **174** from the generator **160**. In the event of coincidence, the comparator provides an output "yes" signal to a line **168**. Conversely, the failure of coincidence prompts the comparator **166** to provide a "no" output to a line **170**. Essentially, a "yes" indicates a win while a "not" indicates the caller has lost.

The elements of FIG. **6** provide a random operating format to determine winners on a somewhat statistical basis; however, the system increases the probability with the passage of time when no win occurs. In that regard, at the outset of an operating cycle, the random number generator **160** provides a random number that is passed through the gate **174** to the register **164**. In the exemplary format, a three-digit number would be provided. At that stage, the caller's random number, from the cell **162**, would be compared with the single number in the register **164** by the comparator **166**. However, with the passage of time, calls are tallied or time is metered by a counter **178**. Accordingly, upon the attainment of a predetermined count, the gate **174** is again qualified to enter another number in the register **164**. Accordingly, an increasing set of numbers are held in the register **164** for comparison with each caller's number. Of course, the more numbers in the register **164**, the higher probability of a caller winning and that relationship depends upon the duration or number of calls since the last winner.

Either a win or a loss as indicated within the processing unit **92** (FIG. **4**) prompts the interface **20** to respond appropriately to the caller announcing his results. If there is a win, the designation may be reinforced and additional identification may be taken as explained above. of course, if the prize simply involves a credit on the caller's telephone bill or his credit account, identification and designation become less critical considerations.

In the event of substantial awards to be claimed, the processing system P1 (FIG. **1**) may actuate the printer PR to produce a positive identification of the winner, which document may be redeemed only by the caller providing the assigned designation along with confirmation of his identification data.

Generally in relation to awards, the processing unit **92** may also utilize a random number format for determining the significance of awards. That is, a random number may be actuated to provide numerals from one through twenty, for example, the magnitude of the number generated for a caller indicating the significance of his award. Normally such information would be provided to the caller and registered in his memory cell.

With respect to memory cells generally, it is to be noted that actuated memory cells may be cleared for callers who are not winners. Accordingly, a limited number of memory cells store the subset of winners for subsequent confirmation processing and so on.

As another operating process format in accordance with the present invention, consider an auction sale. As disclosed herein, the auction format is associated with television as, for example, in the form of a cable channel for dedicated use during an interval of an auction sale.

Preliminarily, in accordance with the disclosed exemplary format, persons wishing to participate in the auction sale would make preliminary arrangements involving utilization of the system to establish authorization data for qualified bidders in cells C1–Cn of the memory **98** (FIG. **4**). In an alternative format, the bidders could simply be qualified immediately before bidding, as on the basis of a charge-card number or other identification.

Generally, it is contemplated that callers are coupled into the system only during the bidding on specific items of merchandise. Accordingly, some prequalification may be desirable to facilitate the rapid accumulation of a bidding group with the introduction of a unit of merchandise.

In accordance with the disclosed format, an auctioneer conducts the sale in a somewhat traditional manner, recognizing that he is interfacing a relatively large audience through the system of the present invention and with a television connection. Specifically, the auctioneer is cued as to audience reaction by a monitor incorporated in the command computer terminal CT (FIG. **1**). Essentially, the auctioneer is given an abstract or summary of the relative bidding as the auction progresses. In one format, the caller sees the auction on a television receiver. That is, the monitor may be covered by a television camera to inform the audience and particularly interested bidders. Consider the detailed steps of the operation.

As the auctioneer announces the next item for sale, it is televised to potentially interested bidders. In addition to being informed of the merchandise, potential bidders might also be reminded of the telephone number for participating in the auction. Accordingly, any interested person at a remote terminal T1–Tn may dial the auction number and obtain access to the processing systems P1–Pn. The caller would have a television set available, tuned for example to a cable channel.

Any preliminary qualification as indicated above will then be performed along with any appropriate designation. With regard to the designation, unless callers are identified as part of the qualification step, the designation unit **96** (FIG. **4**) assigns a limited-digit number to individual callers for use by the auctioneer interfacing the command computer and terminal CT. Further designation and sequencing as disclosed herein also constitute part of the process. To the extent that qualification and designation operations may be performed, the operations are performed as described above with reference to FIG. **4** by the qualification unit **93** and the designation unit **96**. Of course, any of the safeguards and limitations as described herein may be employed as deemed appropriate for an auction format.

After the preliminaries, the auctioneer initiates the bidding with respect to a particular item that is observed by the callers on a television receiver as through a cable channel. Note that the audio may be variously coordinated through the telephone communication facility C and the audio channel of the caller's television. In a simple format, after an introductory phase, communication to callers with respect to the bidding is provided through the television link. Alternatively, the audio unit AD (FIG. **1**) may be employed.

Essentially, the auctioneer initiates the bidding by stating an initial value for the opening bid. Callers are invited to bid by actuating the push buttons **14** (FIG. **1**). For example, the auctioneer may invite an initial bid of one hundred dollars asking callers to so bid by entering an asterisk (*) by punching the button so designated. In accordance with one operating format, cells in the memory **98** (FIG. **4**) are actuated to register the bidding number in identified relationship with several calls. Note that although a record may be desirable, it is not usually necessary to record all bids, particularly at initial bidding figures. In any event, the individual processing units, e.g. unit **92** in individual processors PR1–PRn are interconnected (FIG. **1**) and operate to select the final and key bids.

After attaining the initial bid, the auctioneer may invite further bidding by seeking a bid of two hundred dollars or any bid. Such a bid might be accomplished either by punching the asterisk button to attain the solicited bid, or by using number buttons to enter a different bid, e.g. two hundred fifty by buttons "2", "5" and "0". Again, cells of the memory **98** are actuated to record select bids (sequence) at the higher value.

The status of the bidding is presented to the auctioneer by the monitor of the command computer terminal CT (FIG. **1**). Specifically, the auctioneer is provided an indication of the number of bidders at each level. If a sizeable number of callers bid at a specific value, the auctioneer may wish to advance the price significantly for the next round of bidding. Thus, the auctioneer proceeds until a small group of remaining callers are addressed. Note that the display of the command terminal CT (FIG. **1**) may also inform the auctioneer of fresh bidders.

As the selection process proceeds, signals from the clock CL (FIG. **1**) are introduced to indicate the sequence of bidders. For example, assume the bidding has proceeded to a stage where only three bidders remain active. The auctioneer is informed by the command terminal CT of the order in which the callers made their bids. The sequence is also of record in the cells of the memory **78** (FIG. **4**) to indicate the sequence in the event that the final bid involves more than one caller. Of course, the first caller to respond with a bid would have priority in the purchase.

Normally at the conclusion of the bidding on a particular item, the contents of the cells in the memory **98** would be purged with only the final bidders being held in general memory within the processing unit **92**. Of course, it is important to maintain a record of back-up bidders in the event the sale is not consummated with respect to the first of the highest bidders. That is, a subset of the highest bidders is preserved for each item of merchandise in the event that the highest bidder fails to qualify or the sale otherwise cannot be consummated. Of course, a distinct advantage of the system is the ability to accommodate a vast auction participation group for items of substantial value and as a consequence the distillation of a subset of callers is exceedingly valuable information.

To consider another operating format in association with the television media, a system will now be described whereby television viewers participate on a real-time basis in a game show for prizes. The ability to involve television viewers in a program has the potential of expanding program interest along with the expanded participation.

Game shows in accordance herewith may take any of a wide variety of forms as several well known programs in which studio contestants compete for prizes. In utilizing the system of the present invention to involve remote participants, it may be desirable to preliminarily qualify and designate callers as explained above. Specifically, prior to participating in an actual game show, interested participants interface the system as depicted in FIG. **1**, and in the course of an exchange as described above, the qualification unit **93** and the designation unit **96** cooperate with the processing unit **92** to accomplish preliminary data on potential participants in cells of the memory **96**.

Various games will involve different screening processes and clearances. For example, a child's television game format may require parental clearance and in that regard written communication may be required for approvals. Such approval may require the assignment of a personal identification number to the child player as qualifying identification data.

As explained above, clearances may be perfected through the look-up table **99** (FIG. **4**) in association with the qualification unit **93** or approvals through a consumable key step may be extended to incorporate functions of the processing unit **92** in association with the memory **98**. For example, if qualification simply involves a check-off operation, the look-up table **99** will normally be employed. However, in the case of preregistration for a participant, as in the case of the auction sale, the memory **98** is involved with the qualification unit **93** through the processing unit **92** to establish a data cell C1–Cn for each qualified participant. Thus, each potential participant to be qualified interfaces with the processing unit **92** during a preliminary interval of operation to provide data in one of the cells C1–CN to facilitate qualification for participation during a real-time game show.

At the time of the show, callers are qualified simply by reference to their assigned memory cell data for a verification. Thereafter, the caller's exchange information to supplement their data as with respect to the play which follows. Specifically for example, a caller might select a studio audience participant with whom the caller is to be allied. The interface operation may be essentially as described above wherein a voice generator in the interface **20** (FIG. **1**) provides signals which activate the remote telephone unit to speak the instruction: "If you wish to play with Player No. 1, please push button No. 1; if you wish to play with Player No. 2, please push button No. 2 . . . and so on". The caller may also be instructed to indicate the extent of a wager. For example, "Push the number button indicating the points you wish to risk".

The participant data is stored in an assigned cell of the memory **98** (FIG. **4**) for the caller and as the game proceeds, the processing unit **92** tallies the caller's score. Scores are interrelated between individual processing units to actuate the terminal CT. Thus, individual accounting occurs for each of the calling participants on an on-line basis dependent upon the success of the studio players and their association with the callers. On-going accounting data may be provided at intervals or real time by the recorded voice to each contestant.

According to the described format, after an interval of play, the, processing units, as the unit **92** (FIG. **4**), operate

to isolate a subset of caller-players who have amassed the highest scores. Of course, various arrangements may be provided for awarding prizes to the select subset of winning callers.

The above format involves a real-time game show with an on-line operating format. A somewhat similar format involves nonreal-time operation and in that sense, callers may interface with the system of the present invention before and after the show; however, not primarily during the show. Such a show might involve a quiz for callers based on their ability to perceive and remember occurrences within the show. Preregistration may be employed, however, is not essential. Rather, callers may call after the broadcast of a program. In that event, sequence or time clocking may be very important to limit or control individual interfaces to a specific time or geographic "window". That is, as suggested above, allocation-routing equipment and techniques may be employed in various of the formats to window callers. With the system, callers are screened or qualified at the time of a call, identified in a particular calling sequence, designated for identification and quiz answers are given for subsequent processing. Alternatively, players could participate by providing their credit card for billing or be billed through the "pay-to-dial" network. Consider an exemplary format.

A key to participation in the game show may involve the purchase of a particular product. For example, a person desiring to participate may purchase a product which carries a concealed key number. The number serves as a caller's key to participation in the game show.

In accordance with the disclosed operating format, after watching the broadcast of a television show (possibly a serial episode) the participant actuates the push buttons **14** at one of the remote terminals T**1**–Tn to accomplish an interface communication with the select operating format. For example, the caller may actuate the buttons **14** for the station number "277-7777" which identifies the game format of current description.

Assume responsive operation of the communication facility C to couple the caller through the automatic call distributor AC**1** to the interface **20**. Upon establishing a connection, the interface **20** receives the caller's telephone number through ANI equipment and a data cell in the memory **98** (FIG. **4**) is assigned to the caller. Specifically, for example, associative coupling is provided for the caller through the switch **21** (FIG. **1**) to the processor PR**1** containing the memory **98** (FIG. **4**) and a cell C**2** assigned to the caller. A block format **200** is illustrated in FIG. **7** indicating the data that is developed in the cell C**2**. At the outset, the caller's telephone number is stored in a section **201** followed by uses/month in section **202**.

Next, the caller is greeted and requested to give the key number entitling him to participate in the game show. The instruction constitutes an initial action to take place in an interval of qualification during the time t**1**. The caller actuates the buttons **14** providing digital representations to the qualification unit **93** (FIG. **4**) and the look-up table **99** is consulted. Note that the table **99** may be a large, shared unit that tabulates each of the key numbers and accounts for their use. If the caller has identified a proper key number, the process proceeds and the key number is accounted, i.e. incremented or decremented to the limit of use if any. Alternatively, a repeat information operation may be requested as described in detail above.

As a further check during the qualification stage, the use-rate calculator **100** may function to determine whether or not an excessive number of calls have originated from the designated number. Thus, consideration involves calls or value with reference to a predetermined period of time. Again, a shared calculator may be used or addressing may obtain selectivity on the basis of calling numbers. If a large number of calls have originated from a single telephone terminal, a fraudulent situation may be suggested. Assuming no such indication occurs, the number of uses is registered in a section **200** (FIG. **7**) and the operation proceeds from the interval t**1** to interval t**2**.

During the interval t**2**, the sequencer **94** registers the precise time of the call in the buffer storage **97**, specifically in a section **204** as illustrated in FIG. **7**. With the entry of such data, the system passes from the operating interval t**2** to t**3**.

The caller is next asked to identify himself in some specific manner. For example, the caller may simply be asked to provide the year of his birth. Alternatively, somewhat comprehensive information may be taken as in the form of drivers license numbers, social security numbers and so on. Of course, such data may be employed for subsequent identification of the caller and, accordingly, is registered in the buffer storage **97** (FIG. **4**). Specifically, identification information is registered in section **206** of the block **200** as shown in FIG. **7**.

In addition to receiving identification information from a caller, the system assigns a designation to the caller. Specifically, the random number generator **101** (FIG. **4**) provides a number which may be encrypted along with other identification data as the caller's personal identification to provide a numerical designation that is registered in the storage **97**. Specifically, the designation is stored in a section **208** as illustrated in FIG. **7**. With the designation operation complete, the interval t**3** terminates initiating the data accumulation phase which occurs during an operating interval t**4**.

At this juncture, operating elements within the processing unit **92** will be considered in relation to an explanation of the manner in which select questions are provided to a caller and his answers received and recorded for subsequent processing to determine winners.

Preliminarily, reference will be made to FIG. **8** showing elements involved in the operating format which are contained in the processing unit **92** (FIG. **4**) in association with the memory **98**. To avoid confusion, the elements identified in FIG. **8** are designated by fresh numerals.

To accommodate the exemplary operating format, a dramatic program might be recorded preparatory to the television broadcast. A substantial number of questions would then be formulated based on the dramatic program. For example, "How many people were present when the will was read?"

It is contemplated that the dramatic program would be broadcast to different geographical segments of the country during different time intervals. To accommodate the different time intervals, it is proposed to utilize different questions for each geographic segment. That is, the basic format can remain the same, only the questions change by time zone to avoid study and collaboration on questions as a result of time shifts. A question propounded to a Chicago caller should not be repeated to a Los Angeles caller. In any event, callers might be given three questions randomly drawn from a pool serving one geographic segment and three questions drawn from a different pool serving another geographic segment.

The signals for prompting a voice generator are registered in memory sections MS**1** through MSn. Each of the memory sections MS**1**–MSn is served by an address input AI**1**–AIn respectively. Similarly, the address inputs AI**1**–AIn are

instructed by random number generators NG1–NGn, in turn actuated by decoders DE1–DEn. Consider the operating sequence of the memory MS1 as an example.

The decoder DE1 is responsive to telephone calling numbers (provided by ANI equipment) indicative of a particular geographic area. Note, for example, that area code numbers afford an effective geographic classification of callers which is very useful in many formats or processes of statistical analysis in accordance herewith. Note that geographic (or other) classification in accordance herewith is also accomplished by the called numbers provided. Each of several television stations would solicit calls for different numbers as a result, either by DNIS or call channeling. Select processors would be reached through the interface units, e.g. interface **20** FIG. **1**. In operation, the decoder DE1 determines a call is from a specific geographic area and accordingly provides a signal to actuate the random number generator NG1. As a consequence, the random number generator NG1 provides a series of three random numbers in the form of addresses for the memory MS1. That is, the addresses may simply comprise three alphanumeric bits supplied to the address input AI1 to prompt the provision of three sets of voice generator signals for announcing the three questions in sequence. For example, the first question might be as suggested above: "Push the button on your telephone for the number of persons present in the room when the will was read".

The voice generator signals are supplied from the memory MS1 (within the processing unit **92**, FIG. **4**) to the interface **20** (FIG. **1**) which generates audio signals to actuate the caller's hand piece **10**. Accordingly, the caller is instructed to answer three questions, the responses being recorded in a section **210** of the data block **200** (FIG. **7**). Note that the clock **105** (FIG. **4**) may be utilized to limit the response period allowed each caller.

As indicated above, to accommodate broadcast of the program in a different time slot for a different geographic area, the decoder DEn (FIG. **8**) actuates the random number generator NGn to address the memory MSn to provide three different questions as a result of a random selection. Accordingly, within a time or times (perhaps limited and offset) after the conclusion of the program, a substantial number of callers are accounted for in cells of the memory **98** and similar units of the composite system. The cells indicate sequences of calling and also may contain billing data where appropriate. That is, pay-to-dial operations avoid the need for billing, yet it may still be made of record.

Subsequent to the data accumulation phase of operation, the processing unit **92** (and its equivalents) is actuated during an off-line processing interval to isolate the subset of callers correctly responding to the questions. In accordance with one format, the subset of successful callers may be reduced to a sub-subset as by a random computer "draw" to define a group of significant winners. That is, a random number generator may be employed as explained above.

As an alternative to subsequent processing, the system may inform callers of their success during the course of the interface telephone call. That is, callers might simply be informed by cuing the voice generator: "Your answers are correct and in accordance with the program game, you will now be entered in the sweepstakes draw for the prize . . . " Thus, the format defines a subset then further selects a sub-subset of winners. In any of the various formats, the status of the analysis can be televised by selecting a camera focused on the interface terminal IT.

Still another operating format for the system takes the form of polling operations to determine opinion or facts. An illustrative form of the format is disclosed below again in association with a television broadcast.

Generally, the illustrative polling format is contemplated in association with a television broadcast addressing a matter of current interest as, for example, a political issue or election. A master of ceremonies propounds questions to a viewing audience, many of whom are on-line through an interface of a system of the present invention. The master of ceremonies or commentator instructs the callers who are regulated and controlled by the system of the present invention to provide digital data which the system processes to inform the commentator as with regard to subsets of callers. For example, the commentator may be statistically informed as to the numbers of callers holding specific views. Consider a specific exemplary operating format.

Assume the existence of a system in accordance with the present invention installed for use in association with a television broadcasting facility. Of course, various previous arrangements could be involved; however, according to one arrangement a commentator simply invites members of the viewing audience to call a specific number and express their views with respect to a specific issue. Callers located at terminals T1–Tn (FIG. **1**) activate the terminals to accomplish an interface with one of the processing systems P1–Pn as explained above. Note that the processor (or the interface **20** may involve operation of the qualification unit **93** (FIG. **4**) to prevent callers from loading the poll. That is, to prevent multiple calls from a single terminal that would distort a poll, the qualification unit **93** registers calls in association with the use-rate calculator **100**. Interfacing a specific processor, callers are screened by the qualification unit **93** (FIG. **4**). In such a poll, it may be important to control the sampling group on a statistical basis. For example, it may be desirable to limit callers from each of several geographic areas. Accordingly, by the use of ANI equipment, the caller's telephone number is provided to the qualification unit **93** during the preliminary interval t1, and a determination is performed with regard to the number of involved callers from the geographic area using the look-up table **99**. On attaining a full quota from a specific area, a subsequent caller may be informed that the lines are full. Alternatively, the caller may be requested to provide his telephone number for screening in the event ANI equipment is not available.

The caller may be requested to provide additional information so as to poll a balanced group. For example, a caller might be asked questions concerning age, political registration and so on by prompting the interface unit **20** to pose audio questions and testing the digital results through the qualification unit **93** as with reference to the look-up table **99**.

As indicated above, in the event that the broadcast television program is one of a series, it may be desirable to limit the extent of participation over a period of several programs. Accordingly, the use-rate calculator **100** (FIG. **4**) may be employed in association with the qualification unit **93**. That is, if a calling number has participated in a prior poll, it may be denied access for a subsequent poll or its data not counted. Such operation would involve the use-rate calculator **100** in association with the qualification unit **93** performing logic tests to actuate the voice generator of the interface **20** for providing an appropriate interchange with a caller.

With the screening or qualification of a select group of callers, the sequencer **94** (FIG. **4**) may or may not be involved to identify the order of callers. Also, the designation unit **96** may or may not be involved in view of the fact

that for many polls there is little interest in subsequently identifying callers.

In the poll-format operation of the system, it is important to provide a capability of defining select intervals during which callers may provide data. In one arrangement, with the consummation of a communication interface between a caller and a processor unit, the audio of the television broadcast is keyed from the audio unit AD through the switch **21** (FIG. **1**) for communication to the caller.

With a multiplicity of callers in interface relationship with the processors PR**1**–PRn as function units, a polling question is stated, for example: "If you favor expanded trade with . . . at the tone press button one; if you do not, press button two".

To control the interval of polling, the command computer terminal CT (FIG. **1**) is actuated to enable the callers timely access to the processors.

At the expiration of a polling interval, the interfaces may be terminated or additional questions may be propounded. In any event, subsequent to the data-gathering phase, the bulk data is supplied to the command computer terminal CT incorporating computing facility to isolate subsets for communication by the broadcast. Accordingly, an effective on-line poll can be conducted with statistical sampling control and prompt display of responses.

As explained above, the arrangement of the function unit (or units) may be variously embodied in a single processor or many processors, depending on various considerations as time sharing, multiplexing, paralleling and so on. The systems as described above embody the components bulked together in one location. However, components of the system could be spaced apart geographically, using dedicated lines or polling techniques. An illustrative embodiment is shown in FIG. **9**.

Call distributors CD**1**–CDn are at different geographic locations along with associated interface units IA**1**–IAn and IB**1**–IBn. Each of the interface units, as unit IA**1** is coupled to a central processor **251** as indicated by lines **252**, **254**, **256** and **258**. Each of the lines may take the form of a dedicated telephone line or a polling telephonic coupling.

In the operation of the system of FIG. **9**, the call distributors CD are coupled to a telephonic communication system and accordingly allow the interface units I to provide interface communication between the central processing unit **251** and a multitude of remote terminals T**1**–Tn as illustrated in FIG. **1**. With data accumulated in the cells, it may be variously down loaded as to a central processing station. Thus, the distributed-component system is capable of executing the various formats as explained above with reference to the illustrative structure.

In view of the above explanation of exemplary systems, it will be appreciated that other embodiments of the present invention may be employed in many applications to accumulate statistical data, process such data, and define subsets of callers of concern. While certain exemplary operations have been stated herein, and certain detailed structures have been disclosed, the appropriate scope hereof is deemed to be in accordance with the claims as set forth below.

What is claimed is:

1. A system to be utilized with a telephone facility for on-line handling of customer data contained in a memory in accordance with a select operating format comprising:

means for receiving called terminal digital data (DNIS) signals automatically provided by said telephone facility to identify said select operating format from a plurality of distinct operating formats and for receiving caller telephone number data from said telephone facility;

an operator terminal for use by a person to communicate through the telephone facility;

interface switching means connected to said receiving means and said operator terminal for receiving incoming calls;

computer means coupled to said interface switching means for connecting an incoming call by a caller to said operator terminal based on a condition, said caller telephone number data being stored in said memory such that said computer means in accordance with said select operating format is capable of accessing said customer data on a selected customer which has a telephone number corresponding to said caller telephone number data automatically provided from said telephone facility, said computer means visually displaying said customer data on a selected customer and said operator terminal capable of providing data entries to said memory; and

said customer data on a selected customer contained in memory is updated by incorporating said data entries into said customer data.

2. A system to be utilized with a telephone facility according to claim **1**, further comprising:

voice generator structure coupled to said interface switching means for prompting callers to enter digital data.

3. A system to be utilized with a telephone facility according to claim **1**, further comprising:

qualification structure coupled to said computer means for testing said customer data.

4. A system to be utilized with a telephone facility according to claim **3**, wherein said qualification structure tests a caller provided PIN number.

5. A system to be utilized with a telephone facility according to claim **1**, wherein said operator terminal provides data entries relating to said caller.

6. A system to be utilized with a telephone facility according to claim **1**, wherein said operator terminal is provided with a display of data relating to said select operating format under control of said called terminal digital data (DNIS) signals.

7. A system to be utilized with a telephone facility according to claim **1**, wherein said customer data on said selected customer includes data specifying a limit on use.

8. A system to be utilized with a telephone facility according to claim **7**, wherein said limit on use specifies a predetermined number of uses.

9. A system to be utilized with a telephone facility according to claim **7**, wherein said limit on use specifies a one time only use.

10. A system to be utilized with a telephone facility according to claim **7**, wherein said limit on use specifies a use relating to a dollar amount.

11. A system to be utilized with a telephone facility according to claim **7**, wherein said customer data on a selected customer includes data based on a specified limit on a number of calls from said caller during specified multiple intervals of time wherein said specified limit is automatically refreshed at the beginning or the end of each of said multiple intervals of time.

12. A system to be utilized with a telephone facility according to claim **7**, wherein said limit on use specifies an extent of access.

13. A system to be utilized with a telephone facility for on-line handling of customer data contained in a memory in accordance with a select operating format comprising:

means for receiving called terminal digital data (DNIS) signals automatically provided by the telephone facility

to identify the select operating format from a plurality of distinct operating formats;

an operator terminal for use by a person to communicate through the telephone facility;

interface switching means connected to the receiving means and the operator terminal for receiving incoming calls; and

processing means connected to the interface switching means for receiving customer number data entered by a caller and for storing the customer number data in a memory and based on a condition coupling an incoming call to the operator terminal, the processing means visually displaying the customer number data, the operator terminal providing other data entries to the memory to update data relating to the caller

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EXHIBIT 20

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(54) **VOICE-DATA TELEPHONIC INTERFACE CONTROL SYSTEM**

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(63) Continuation of application No. 08/058,452, filed on May 7, 1993, now Pat. No. 5,359,645, which is a continuation of application No. 07/680,879, filed on May 5, 1991, now Pat. No. 5,224,153, which is a continuation-in-part of application No. 07/481,403, filed on Feb. 20, 1990, now Pat. No. 5,014,298, and a continuation-in-part of application No. 07/335,923, filed on Apr. 10, 1989, which is a continuation-in-part of application No. 07/312,792, filed on Feb. 21, 1989, now Pat. No. 5,073,929, which is a continuation of application No. 07/194,258, filed on May 16, 1988, now Pat. No. 4,845,739, which is a continuation-in-part of application No. 07/018,244, filed on Feb. 24, 1987, now Pat. No. 4,792,968, which is a continuation-in-part of application No. 06/753,299, filed on Jul. 10, 1985, said application No. 08/058,452, is a continuation-in-part of application No.07/194,258, which is a continuation-in-part of application No. 07/018,244, which is a continuation-in-part of application No. 06/753,299.

(51) **Int. Cl.**[7] **H04M 11/00**

(52) **U.S. Cl.** **379/93.12**; 379/88.16; 379/88.21; 379/265

(58) **Field of Search** 379/92, 97, 93, 379/88, 67, 142, 95, 93.12, 91.01, 91.02, 92.01, 92.03, 93.02, 93.03, 93.17, 93.23, 93.25, 88.01, 88.18, 88.2, 88.25

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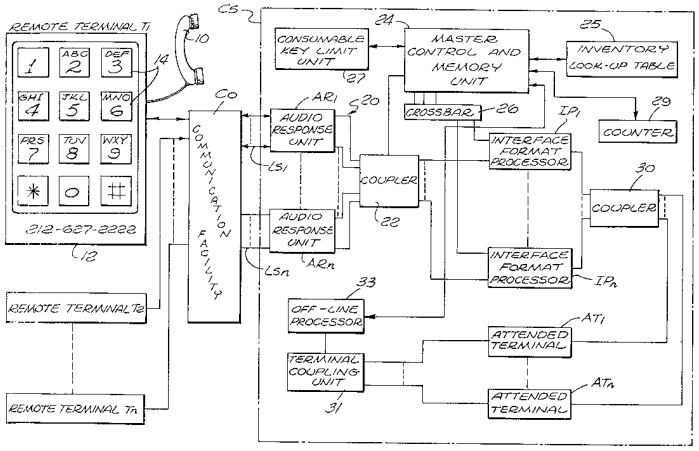
Primary Examiner—Stella Woo

(57) **ABSTRACT**

In an audio-digital telephone interface system, selective operation prompts a caller with oral instructions to provide: digital control signals, digital data signals (numeric) or audio signals. Inbound and outbound operations are involved and inbound callers are qualified as by automatic number identification (ANI) signals and consumable key operation. A data cell is loaded in accordance with an operating program and the resulting data packet is flagged depending on the presence of audio signals. Data packets are returned to storage, as for subsequent addressing to call up, as to process or cue a caller. The illustrative format receives and organizes order data for goods or services or to isolate a subset or a sub-subset, of callers.

82 Claims, 3 Drawing Sheets



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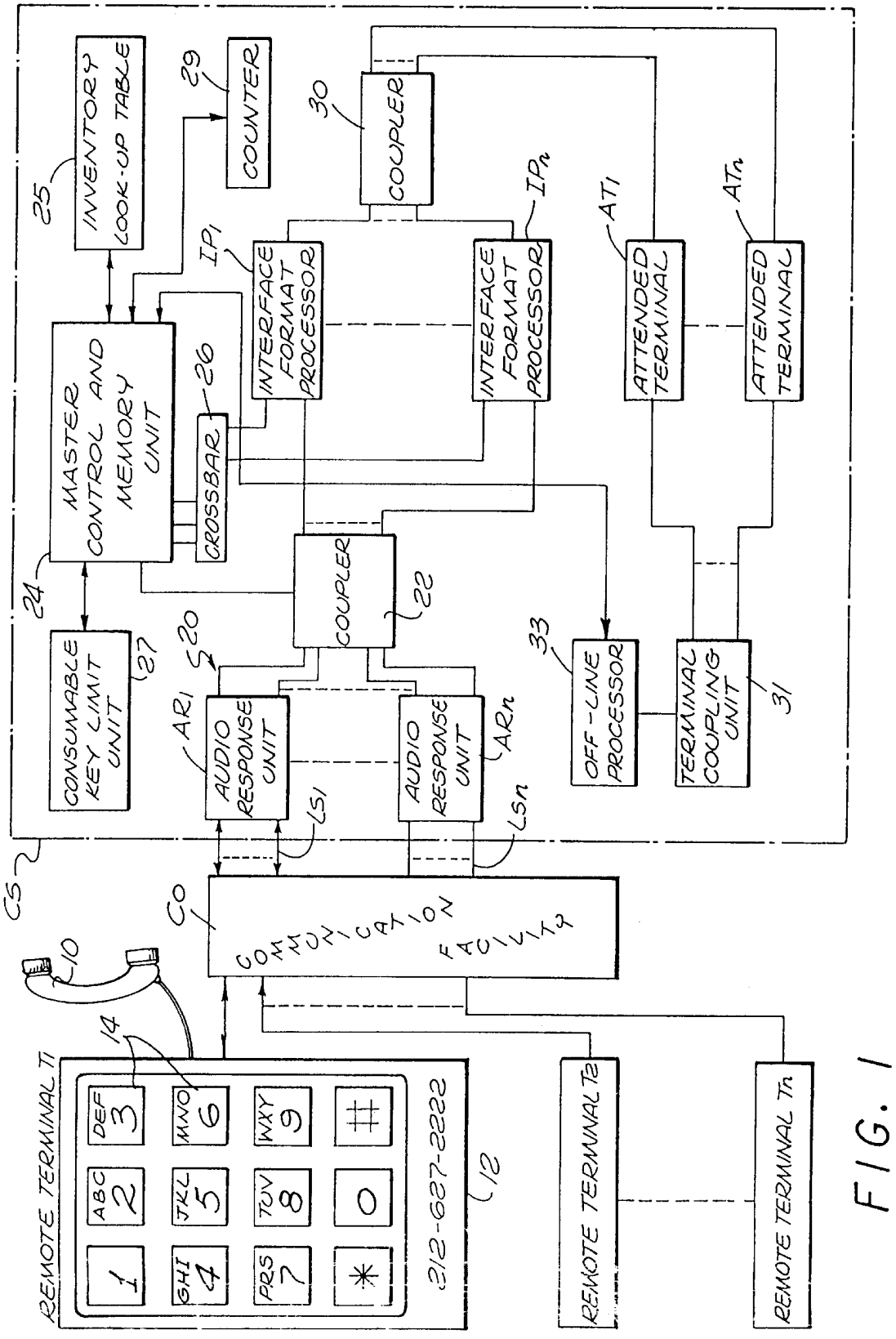

INVENTORY LOOK-UP TABLE
25
COUNTER
29
COUPLER
30
IP1
IPn
INTERFACE FORMAT PROCESSOR
INTERFACE FORMAT PROCESSOR
AT1
ATn
ATTENDED TERMINAL
ATTENDED TERMINAL
MASTER CONTROL AND MEMORY UNIT
26
CROSSBAR
24
COUPLER
22
20
CONSUMABLE KEY LIMIT UNIT
27
AR1
ARn
AUDIO RESPONSE UNIT
AUDIO RESPONSE UNIT
33
OFF-LINE PROCESSOR
TERMINAL COUPLING UNIT
31
LS1
LSn
C5
C0
COMMUNICATION FACILITY
10
14
REMOTE TERMINAL T1
DEF 3
MNO 6
WXY 9
ABC 2
JKL 5
TUV 8
0
GHI 4
PRS 7
212-627-2222
12
REMOTE TERMINAL T2
REMOTE TERMINAL Tn

FIG. 1

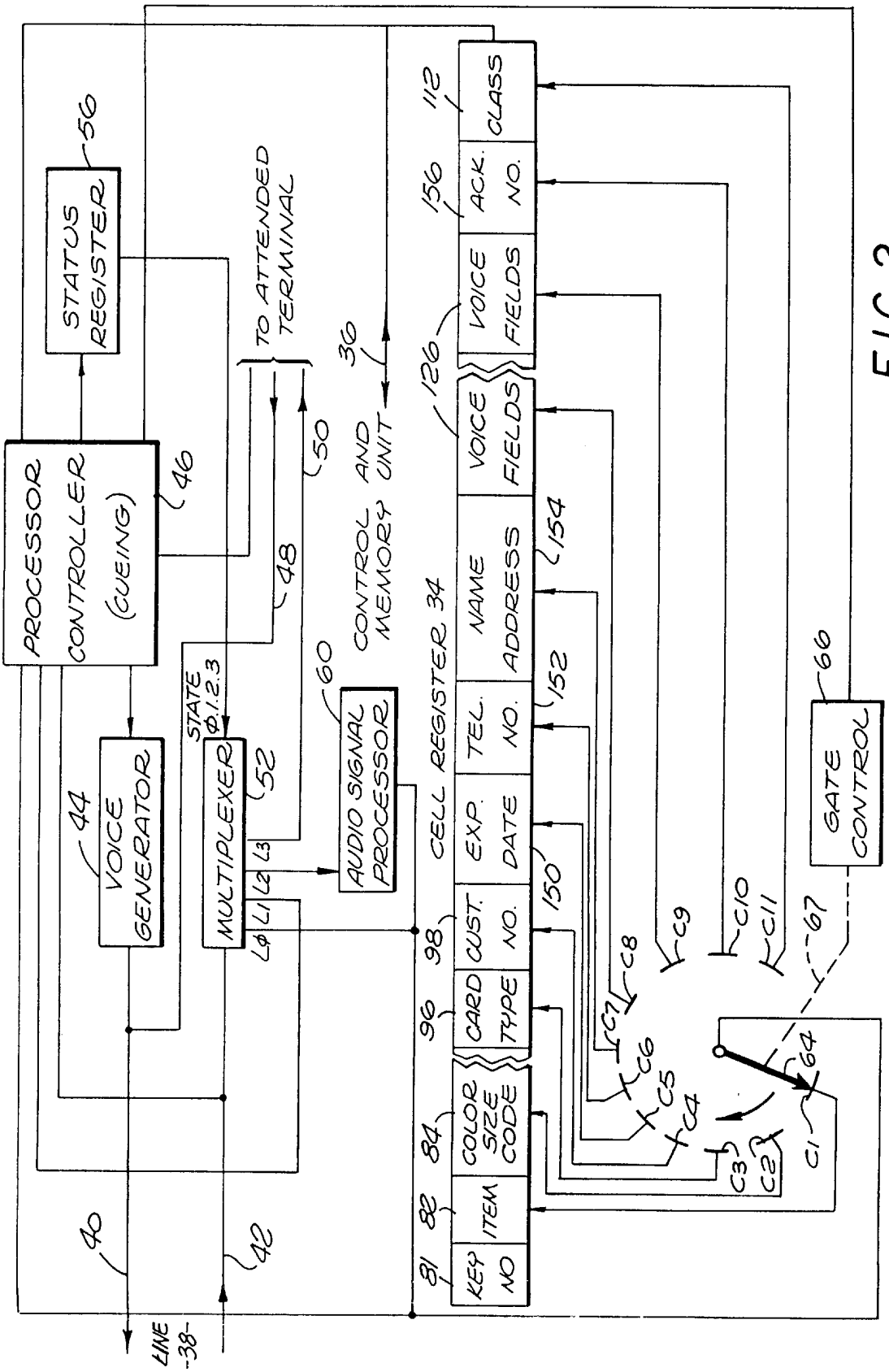
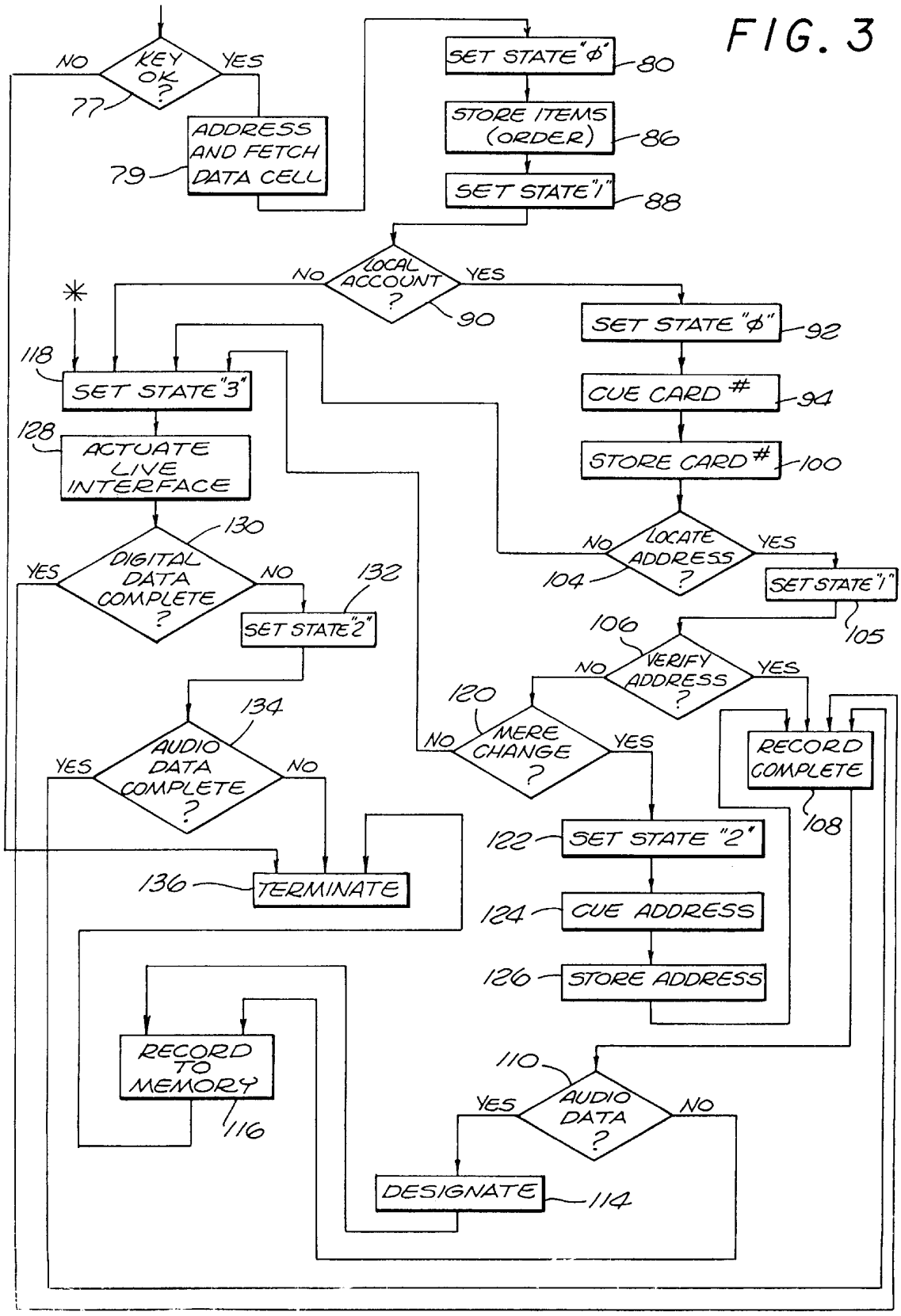

PROCESSOR CONTROLLER (QUEING)
46
STATUS REGISTER
56
TO ATTENDED TERMINAL
36
50
48
CONTROL AND MEMORY UNIT
VOICE GENERATOR
44
MULTIPLEXER
52
STATE Φ.1.2.3
Lφ L1 L2 L3
AUDIO SIGNAL PROCESSOR
60
CELL REGISTER 34
CLASS
ACK. NO.
VOICE FIELDS
VOICE FIELDS
NAME ADDRESS
TEL. NO.
EXP. DATE
CUST. NO.
CARD TYPE
COLOR SIZE CODE
ITEM
KEY NO
112
156
126
154
152
150
98
96
84
82
81
GATE CONTROL
66
67
64
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
40
42
LINE
38

FIG. 2

FIG. 3


KEY OK ?
NO
YES
77
ADDRESS AND FETCH DATA CELL
79
SET STATE "ϕ"
80
STORE ITEMS (ORDER)
86
SET STATE "1"
88
LOCAL ACCOUNT ?
NO
YES
90
SET STATE "ϕ"
92
CUE CARD #
94
STORE CARD #
100
LOCATE ADDRESS ?
NO
YES
104
SET STATE "1"
105
VERIFY ADDRESS ?
106
NO
YES
MERE CHANGE ?
120
NO
YES
RECORD COMPLETE
108
SET STATE "2"
122
CUE ADDRESS
124
STORE ADDRESS
126
SET STATE "3"
118
ACTUATE LIVE INTERFACE
128
DIGITAL DATA COMPLETE ?
130
YES
NO
SET STATE "2"
132
AUDIO DATA COMPLETE ?
134
YES
NO
TERMINATE
136
RECORD TO MEMORY
116
AUDIO DATA ?
110
YES
NO
DESIGNATE
114

VOICE-DATA TELEPHONIC INTERFACE CONTROL SYSTEM

This is a continuation of application Ser. No. 08/058,452 filed May 7, 1993 and entitled "Voice-Data Telephonic Interface Control System", issued Oct. 25, 1994 as U.S. Pat. No. 5,359,645, which was a continuation of application Ser. No. 07/680,879, filed May 5, 1991 and entitled "Voice-Data Telephonic Interface Control System", issued Jun. 29, 1993 as U.S. Pat. No. 5,224,153, which is a continuation-in-part of application Ser. No. 07/481,403 filed Feb. 20, 1990 and entitled "Voice-Data Telephonic Control System", issued May 7, 1991 as U.S. Pat. No. 5,014,298 which was a continuation-in-part of application Ser. No. 07/312,792 filed Feb. 21, 1989 and entitled "Voice-Data Telephonic Control System", issued Dec. 17, 1991 as U.S. Pat. No. 5,073,929, which was a continuation-in-part of application Ser. No. 07/194,258 filed May 16, 1988 and entitled "Telephonic-Interface Statistical Analysis System", issued Jul. 4, 1989 as U.S. Pat. No. 4,845,739, which was a continuation-in-part of application Ser. No. 07/018,244 filed Feb. 24, 1987 and entitled "Statistical Analysis System For Use With Public Communication Facility", issued Dec. 20, 1988 as U.S. Pat. No. 4,792,968, which was a continuation-in-part of application Ser. No. 06/753,299 filed Jul. 10, 1985 and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned. Also, this application is a continuation-in-part of application Ser. No. 07/335,923 filed Apr. 10, 1989, and entitled "Telephonic-Interface Statistical Analysis System", which is a continuation of application Ser. No. 07/194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U.S. Pat. No. 4,845,739, which is a continuation-in-part of application Ser. No. 07/018,244 filed Feb. 24, 1987, and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 4,792,968, which is a continuation-in-part of application Ser. No. 06/753,299 filed Jul. 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned. The benefit of the earlier filing dates in the United States is claimed under 35 U.S.C. §120.

BACKGROUND AND SUMMARY OF THE INVENTION

As the use of computer techniques has steadily grown, related telephonic communication techniques also have expanded. In that regard, telephone systems have been developed for effectively transmitting digital data in forms commonly utilized by computer apparatus. At a more personal level, the traditional push buttons of telephone instruments have been utilized to provide digital signals at a remote location for both data and control functions. Consequently, various operations have been performed.

In the typical operation of a telephone instrument as a digital input device, voice messages prompt callers to provide data and control signals by actuating the alphanumeric buttons of a conventional telephone. Detailed forms of such systems have been proposed in association with computers to provide various services, and one such system is disclosed in U.S. Pat. No. 4,792,968 issued Dec. 20, 1988, to Ronald A. Katz from an application Ser. No. 07/018,244 filed Feb. 24, 1987.

Although traditional systems for interfacing an individual person at a telephone terminal with a computer or data processor have been effective, such systems have been somewhat limited in application. In general, the present

invention is based on recognizing the need in such systems to accommodate voice signals as to provide recorded audio data, as for subsequent use. Accordingly, the system of the present invention accommodates a caller to identify digital control signals, digital data signals and audio signals, all in an organized format as to accomplish a record for subsequent processing or use.

To consider a specific example, systems have been proposed in the past for interfacing individual telephone terminals with computers, as for sales applications. Individual callers might dial to accomplish a computer interface, then provide ordering data by actuating the telephone terminal buttons to specify goods or services. One such system is disclosed in a co-pending related patent application entitled "Telephone Interface Statistical Analysis System", filed May 16, 1988, and bearing a Ser. No. 07/194,258 (now U.S. Pat. No. 4,845,739) and a related prior application, now U.S. Pat. No. 4,792,968. In the use of such systems, the need is recognized for improved capability regarding audio data.

In general, the present invention comprises a telephone computer interface system accommodating digital and vocal telephonic communication, the system being expanded to accommodate and flag audio data distinct from digital data. In using the disclosed system, either outbound or inbound calling operations attain an interface with a central data processing system. Depending on the course of communication during the interface, various states are implemented for the central system to receive and identify: digital control signals, digital data signals and audio or voice, signals. Somewhat conventional operation may involve automated vocal communications to cue the caller and keypad digital communications from the caller. Generally, data received from the caller is set in memory for subsequent use or processing. The data may be addressed as to cue a remote terminal or to isolate a set or subset. Callers may be qualified by automatic number identification (ANI) signals checked against an assigned consumable key number. Thus, the system accommodates flexible control and data accumulation (including cued audio) to accommodate any of various specific interface applications or formats.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, an exemplary embodiment exhibiting various objectives and features hereof is set forth. Specifically:

FIG. **1** is a block diagram of a system constructed in accordance with the present invention;

FIG. **2** is a block and schematic diagram of a component in the system of FIG. **1**; and

FIG. **3** is a flow diagram illustrating the operating process of the structure represented in FIG. **2**.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

As required, a detailed illustrative embodiment of the present invention is disclosed herein. However, physical communication systems, data formats and operating structures in accordance with the present invention may be embodied in a wide variety of forms, some of which may be quite different from those of the disclosed embodiment. Consequently, the specific structural and functional details disclosed herein are merely representative; yet in that regard, they are deemed to afford the best embodiment for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. **1**, a series of remote terminals T**1**–Tn (telephone instruments) are represented (left). The terminals T**1**–Tn may be similar and accordingly only the terminal T**1** is shown in any detail. The indicated terminals T**1**–Tn represent the multitude of telephone terminals existing in association with a communication facility CO which may comprise a comprehensive public telephone network.

The communication facility CO, accommodating the individual terminals T**1**–Tn, is coupled to a central processing station CS generally indicated by a dashed-line block. Within the station CS as illustrated, processors are provided to interface the terminals T**1**–Tn so as to accomplish a desired operating format, and accordingly accumulate data relating to individual callers.

Calls to and from the terminals T**1**–Tn are individually processed in accordance with a specific format to accomplish a data cell or packet. For example, the objective of a call may be to order an item of merchandise to implement a mail-order operation. Similarly, a service may be specified and ordered. Accordingly, the interface accomplishes data as a cell for processing the order. In other exemplary formats, the system may function for public polls, lotteries, auctions, promotions and games.

At any instant of time, the collective interface involving the communication system CO and the processing station CS may involve several thousand calls. Accordingly, the station CS may take the form of a sizeable computer or mainframe capable of simultaneously controlling smaller units or directly operating to process many calls involving individual interfaces. Although numerous possible configurations are available, for purposes of explanation, the central station CS of the disclosed embodiment includes a control unit functioning with a plurality of audio response units and associated individual processors and attended terminals.

Essentially, the system of the present invention accumulates data from the remote terminals T**1**–Tn in cells, which data may include audio data and digital data (numerical) flagged or otherwise distinguished for subsequent expedient processing. Accordingly, the system enables a person at a terminal (T**1**–Tn) to provide data in both audio and digital forms. For audio transmissions, the person utilizes the telephone handpiece (microphone) while for digital communications, the person utilizes the telephone push buttons (keypad).

Considering the exemplary telephone terminal T**1** of FIG. **1** in greater detail, a handpiece **10** (microphone and earphone) is shown along with a panel **12** provided with a rectangular array of individual push buttons **14** in a conventional configuration. Of course, the handpiece **10** accommodates analog signals while the panel **12** is a digital apparatus. As disclosed in detail below, a person is informed or cued through the handpiece **10** (earphone) to provide data in accordance with a specific format. In accordance herewith, the person may provide signals utilizing either the buttons **14** or the handpiece **10** (microphone).

In conventional telephone structures, alphabetic and numeric designations are provided on the buttons **14**. For example, several of the buttons **14** carry three letters along with a decimal digit. Specifically, the button designated with the numeral "2" also carries the letters "A", "B" and "C". Thus, the buttons **14** encompass: the numerals "0–91", the symbols "*" and "#" and the alphabet except for the letters "Q" and "Z".

At this stage, some specific aspects of the communication interface are noteworthy. Essentially, by telephonic dialing, the communication facility CO is coupled selectively to certain of the terminals T**1**–Tn through audio response units AR**1**–ARn. For example, as a result of dialing a specific telephone number at one of the remote terminal units T**1**–Tn, the communication facility CO couples the actuated terminal through one line of several sets of lines LS**1**–LSn to one of the audio response units AR**1**–ARn. Note that automatic call distributors may be utilized as well known in the art.

From the audio response units AR**1**–ARn, incoming lines **20** are received through a coupler **22** for communication with individual interface format processors IP**1**–IPn. Note that the interface processors IP**1**–IPn are illustrated as separate and distinct units; however, as mentioned above, it is to be recognized that various structural processing combinations may be used, based on time sharing, parallel processing, compiler techniques, bus technologies and other well known computer techniques to accomplish the objective processing as explained in detail below. In some instances, certain of the structure and functions of the processors IP**1**–IPn can be variously incorporated in the units AR**1**–ARn. Of course, specific arrangements and configurations will likely be implemented based on available hardware and software development.

The coupler **22** is also connected to a master control and memory unit **24** which is associatively coupled to a look-up table **25**, a consumable key limit unit **27**, a subset counter **29** and through a crossbar **26** to each of the processors IP**1**–IPn. Note that both the function and structure of crossbars for selectively interconnecting multiple parallel structures are well known in the computer arts. For a detailed description of crossbars, see the book, "High-Performance Computer Architecture" by Harold S. Stone, published by Addison-Wesley Publishing Company, 1987.

The coupler **22** essentially functions as a switch as well known in the prior art to establish line couplings from one line of an audio response unit (AR**1**–ARn) to one of the interface processors IP**1**–IPn. The operation of the coupler **22** is implemented in association with the control unit **24** which may be programmed to execute control and memory functions as detailed below.

Again, the division of functions between the unit **24**, the units AR**1**–ARn and the processors IP**1**–IPn may vary considerably depending on available structures and techniques. The disclosed system is merely exemplary in that regard.

Generally, in a sales format, the interface processors IP**1**–IPn receive basic record data from the unit **24** and order data from the terminals T**1**–Tn. In a multiple format configuration, program data may be stored in the processors IP**1**–IPn or supplied from the unit **24**. In any event, in accordance with a program or format, a packet of data is collected in a processor IP**1**–IPn during an interface. After being organized in a call and flagged, the data packet is returned from an interface processor IP**1**–IPn to the unit **24** for subsequent use or processing. For outbound operation, the unit **24** functions as an automatic dialer to attain desired connections through the units AR**1**–ARn in accordance with stored telephone numbers.

Again, considering a sales format, typically individual data cells or packets of data are organized and returned to the unit **24** for processing which ultimately involves performing a service or instructions for shipping merchandise and billing. In some formats, during the course of interfaces with certain callers, the need may arise for person-to-person oral communication. In accordance herewith, to accommodate that need, the interface processors IP**1**–IPn may be individually associated through a coupler **30** with an attended

terminal AT1–ATn. For processing operations as mentioned above, the terminals AT1–ATn may be connected through a coupling unit **31** to an off-line processor **33**, also connected to the control and memory unit **24**.

Recapitulating to some extent, the general operation of the system of FIG. **1** involves the development and maintenance of individual data packets or cells drawn from the unit **24** to the individual processors IP1–IPn during interface communications with individual remote terminals T1–Tn. In the exemplary format as treated below, each data cell manifests a merchandise order identifying specific goods, a specific customer, a shipping destination and other related data. In accordance herewith, data in individual cells may include flagged audio data. In any event, the operation of the system involves the organized accumulation of mail-order data (some of which may be audio) in the unit **24** addressable for subsequent use by the processor **33**, as to implement billing and delivery of services or merchandise.

As explained in detail below, the data cells (manifesting individual orders) are developed in the individual processors IP1–IPn. Structural details of an exemplary processor are shown in FIG. **2** and will now be considered. A cell register **34** (FIG. **2**, center) is divided into fields to illustrate an exemplary data format. Specifically, the cell register **34** defines several separate fields for data components manifesting an exemplary order. Record data for some of the fields may reside in the master control and memory unit **24** (FIG. **1**) before the occurrence of any telephone interface. However, other fields are loaded or modified during the period of the interface with a caller at one of the remote terminals T1–Tn providing elements of the data.

Generally, variously accumulated record data is initially loaded into the cell register **34** from the control and memory unit **24** (FIG. **1**) through a bus **36** (FIG. **2**, right center) that is connected through the crossbar **26** (FIG. **1**) to the unit **24**. The same bus **36** accommodates movement of a completed or modified data cell to memory (in the unit **24**).

As suggested above, some fields in the cell register **34**, as those pertaining to a specific merchandise order, are always loaded by data resulting from the interface and received through a two-way line **38** (FIG. **2**, upper left). That is, a caller is steered through the interface interval, being prompted or cued to provide responses selectively in the form of: (1) digital control signals, (2) digital data signals or (3) audio signals. Also, in certain applications digital ANI telephone signals may be received through the line **38** indicating the telephone dialing number of the caller. Specifically, ANI (automatic number identification) signals may be provided from the communication facility CO (FIG. **1**) automatically indicating the telephone number for the calling terminal T1–Tn. The ANI signals may be treated either as control or data signals on being received through an audio response unit (AR1–ARn, FIG. **1**), the coupler **22**,and the line **38** (FIG. **2**).

Generally, control signals in the line **38** are utilized for the controlled registration of digital data signals and audio signals as appropriate to each specific interface. Of course, the data and audio signals also are received through the line **38**.

For convenience of illustration and explanation, the line **38**, connected to the coupler **22** (FIG. **1**) is shown to include two separate communication paths, specifically an outgoing path **40** (FIG. **2**) and an incoming path **42**. Of course in practice, the two paths would comprise a common two-way or bidirectional line. For outbound calls, the master control and memory unit **24** (FIG. **1**) supplies dialing signals through the coupler **22** and a unit (AR1–ARn) to the facility CO. As indicated above, an automatic dialer structure is incorporated as well known in the art. On completion of a connection to a terminal T1–Tn, the unit **24** actuates a processor IP1–IPn through the crossbar **26**. Thus, an addressed data packet is used to advise, inform or cue a person at a connected remote terminal (T1–Tn). In some cases, for example inbound calls, an audio response unit AR1–ARn may perform some preliminary operations, after which calls are referred to a processor IP1–IPn through the coupler. Usually, coupling a remote terminal T1–Tn to a processor IP1–IPn initiates an interface format.

During an interface operation, as with the processor IP1 for example, the connection through the coupler **22** and the audio response unit AR1–ARn remains active. For example, the outgoing communication path **40** (FIG. **2**) is provided with voice signals from a voice generator **44** that is in turn controlled by a processor controller **46**. Generally, the controller **46** may possess some substantial computing capability along with storage. Accordingly, it responds to an operating program as disclosed in detail below to accomplish an interface format.

The outgoing communication path **40** of the line **38** also is connected to one of the attended terminals AT1–ATn. The signal route in FIG. **2** is to the path **40** either from a line **48** or the voice generator **44**. With respect to the incoming path **42**, signals are provided through a multiplexer **52** to provide various lines L0, L1, L2 or L3 exclusively active. The line L3 or line **50** is coupled to an attended terminal AT1–ATn (FIG. **1**). As indicated above and explained in detail below, under various circumstances, signals from persons at terminals are variously transferred, including transfer to an attended terminal (AT1–ATn, FIG. **1**). Thus, the status of an interface may vary, one status or state designating an interconnection of one of the remote terminals T1–Tn with an attended terminal, that is, one of the terminals AT1–ATn.

The status of an interface with a caller is indicated by a status register **56** (FIG. **2**, upper right) which is controlled by the process controller **46** and in turn controls the multiplexer **52**. The status register **56** basically comprises a two-bit counter capable of indicating four states to control the lines L0–L3 from the multiplexer **52**, as indicated below.

State	Operation	Active Multiplexer Line
"0"	Cue data signals (digital)	L0
"1"	Cue control signals (digital)	L1
"2"	Cue audio signals	L2
"3"	Actuate live interface	L3

The states "0", "1" and "2" indicate operations to prompt persons to provide signals digitally. Alternatively, any of the states may be used merely to inform a person where no response is to be received. As indicated above, in the state "3", the caller speaks directly with an operator to provide information in an audio form. The other states accommodate computer interface signals. Implementing the different states, the multiplexer **52** (controlled by the status register **56**) selectively activates one of the four lines L0, L1, L2 or L3 to receive a specific class of signals from the path **42**.

Generally, the control signals received in the line L1 are applied to actuate the controller **46**. The data or information signals received in the lines L0 and L2 are provided to the cell register **34** through a gating network **62** (lower left). Several connections are involved. The line L3 is coupled to an attended terminal (AT1–ATn, FIG. **1**) through a line **50**.

The line **L0** (digital data) is connected to the controller **46** and to a movable contact **64** of the gating network **62**. The line L1 is connected only to the controller **46**. The line L2 (audio) is connected through an audio processor **60** to the controller **46** and to the movable contact **64**.

The gating network **62** is illustrated in an electromechanical form for ease of explanation with the movable contact **64** displaceable to engage each of the stationary contacts C1–C11 in sequence. However, in an actual embodiment, a well known analogous solid-state configuration would be employed.

In accordance with the symbolic representation of the gating network **62**, the movable contact **64** is driven by a gate control **66** to sequentially encounter stationary contacts C1–C11 which are coupled to fields of the register **34**. A mechanical drive connection is indicated by a dashed line **67**, the gate control **66** being actuated by the process controller **46** as described in detail below. Somewhat more specifically, the operations directed by the controller **46** are illustrated in FIG. **3** and will now be considered in detail.

The flow diagram of FIG. **3** implements an exemplary mail-order format for a sales organization with existing "local" customers of record (identified by telephone number, credit card number, etc.) acceptable for credit transactions. To pursue an example, customers are provided with a "special" catalog from which a single order may be placed for each telephone terminal. Thus, customers are assigned a consumable key of "one" to accordingly limit ordering.

Calls from customers are coupled through an audio response unit, e.g. unit AR1 (FIG. **1**) and the coupler **22** to the master control unit **24**. In one format, the customer is recognized by a telephone number manifest by automatic number identification (ANI) signals. Customer data is fetched to the consumable key limit unit **27** based on the calling telephone number. The call is then tested to proceed conditionally on the key not being previously used or consumed. The test is illustrated by a block **77** (FIG. **3**) and is executed by the unit **27** with reference to a field **81** of the data packet as shown in the register **34** (FIG. **2**). If there has been a previous call, the instant call is terminated as indicated. Otherwise, the data cell is fetched from the unit **24** to a cell register, e.g. register **34** (FIG. **2**). The operation is indicated by the block **79** (FIG. **3**). Thus, calls to a specific format number are limited to "one". Of course, consumable keys may be set to accomplish any desired limitation with respect to a specific format. Format interface operation follows approval of a call.

At the beginning of an interface operation, the processor involved, e.g. processor IP1 (FIG. **2**) is set to state "0" as indicated by the block **80** (FIG. **3**). That state, also indicated by the status register **56** (FIG. **2**) controls the processor **46** so that a caller is cued for digital data signals to be formed by use of the buttons **14** at the caller's remote terminal. Specifically, the caller might be cued: "Please indicate your first item by keying in the three-digit catalog number." The audio is reproduced at the terminal.

As will be described in detail below, identification for an item is stored in a field **82** (FIG. **2**) of the cell register **34**. Similarly, color, size and code data for selected items are cued and stored in a field **84**. Of course, other items may be ordered with the consequence that they are recorded in further of the fields **82** and **84** of the cell register **34**. The operation also is represented by the block **86** in FIG. **3** and might be cued: "Please indicate your next item or push button '3' to indicate you are finished."

At the conclusion of the item ordering, the system sets state "1" (cue control) in the status register **56** (FIG. **2**) as indicated by block **88** (FIG. **3**). Note that the state "1" also may be attained by a period of silence from the caller. In any event, the subsequent operation involves a junction, as indicated by the block **90**, a determination to be made by whether or not the caller is a customer of record, e.g. "local account?" As an example, the caller might be cued: "If you have a local account, please push button '1'; if not, please push button '2'."The resulting digital control signals set the course for subsequent operations as implemented by the controller **46**. Of course, the indication may be confirmed or originated from the data packet.

If a caller has a local account, for example, implying that the caller's address is in the data packet, the system status is reset to state "0" (cue data) as indicated by block **92**. In that event, the system resumes the accumulation of non-vocal digital data by cueing for the card number as indicated by the block **94**. Note that with the indication of a local account, a designating code (customer I.D. number) is set in the field **98** of the cell register. Concurrently, the expiration date for the customer's account or card is stored in the field **150**. These operations are indicated by the block **100** (FIG. **3**).

Pursuing the example, the system is again set in state "1" to cue for control signals as indicated by the block **104** (FIG. **3**). Specifically, as indicated by a junction block **104**, a search is made for the customer's identification number. If the number is found, another control signal is cued. Specifically, as indicated by the block **106**, the customer's address is verified. If the proper address is confirmed to be registered for the customer, the record is completed as indicated by the block **108**. This operation, performed by the unit **46**, may involve inventory verification or other internal operations as described in detail below.

Next, the system operation progresses to an internal decision block **110** to test whether or not audio data has been received. Essentially, the audio test simply queries whether or not the status register **56** has been set to manifest the existence of the states "1" or "3" to enter audio data. Control in that regard is by the controller **46** (FIG. **2**).

In the example-as treated to this point, neither states "2" nor "3" has occurred. However, depending on the determination, a field **112** (FIG. **2**) of the cell register **34** is set with one of the two possibilities. If audio data had been entered, the block **114** would indicate a class designation of binary "1" in the field **112**. Conversely, a class representative "0" is entered in the field **112** for orders involving no audio data. The operation next proceeds to record the loaded cell in memory as indicated by the block **116**.

The operation as outlined to this point has covered routine orders, i.e. customers with local accounts placing orders that can be processed entirely on the basis of digital control signals and digital data, signals (no audio) entered digitally as outlined above. the accommodation of other orders involving audio communication will now be considered.

Generally, audio operations involve either the introduction of a person-to-person interface, as for example for a new customer, or audio signal interface, as for example to record a new address for an existing customer. During any format operation, these operations may be actuated variously in combination with digital data control and recording. Such operations may involve proceeding through a block **118** (FIG. **3**, upper left); however, other possibilities exist. One such possibility occurs when a caller indicates that his record address is not correct. Specifically in that regard, the junction block **106** (FIG. **3**, right center) queries "verify address?" The cue or prompt might take the form: "According to our records, you are Mr. John Henry with a billing and

shipping address of 10 Beverly, Los Angeles, Calif." A "no" response results in another test as indicated by the block **120** questioning whether or not the present situation is merely a case of an altered address. If so, the system proceeds from a "yes" determination of the block **120** to obtain an audio record of the new address. As indicated by the block **122**, state "2" is set and the caller is cued to state his new address as indicated by the block **124**. The address is processed by the audio processor **60** (FIG. **2**) and stored as audio data as indicated by the block **126** (FIG. **3**). The operation then proceeds on the basis of a complete record as indicated by the block **108**. Note that in this instance audio data is registered in the cell **34** (FIG. **2**) specifically in voice fields **126** with the status register **56** (FIG. **2**, upper left) indicating state "2". Consequently, the junction block **110** (FIG. **3**, lower right) indicates the presence of audio data with the result that the cell register **34** stores a class "1" bit to indicate the order data includes audio data.

Returning to the block **118** (FIG. **3**, upper left) the operation for the case of a complex address change involves setting the operating state "3" i.e. actuating a live interface. Other patterns also may lead to that operating sequence. For example, as suggested above, patterns for a line operator interface may include a non-local account or failure to locate account data. Also, throughout the interval of an interface, a caller may prompt a direct personal contact simply by depressing the telephone button designated "*". Accordingly, as indicated in FIG. **3** at block **118**, the occurrence of an asterisk signal (*) sets state "3" with operation proceeding from block **118** to activate a live interface as indicated by the block **128**. The controller also may initiate state "3" as when meaningless data is received.

It is noteworthy that in an operating system, at any specific time, the demand for operators may exceed the number of operators. In that event, callers who cannot be accommodated are cued to punch in their telephone numbers and/or other data, and/or record via audio or numeric signals such data as to return calls when operators are available. The logic of such an operation is embodied in the block **128**, "actuate live interface".

When a live interface is actuated involuntarily for a caller in accordance with the system as described, an incentive is offered to keep the caller on the line. Specifically, the operation involves the step represented by the block **118** (FIG. **3**) "set state '3'" and the counter **29** (FIG. **1**, upper right). The master control unit **24** might actuate the unit AR1 to produce an audio message at the terminal T1 as follows: "You are being transferred to a live operator. Please stay on the line as you may win a valuable prize." Immediately, the unit **24** increments the counter **29**. If a specified count is attained, e.g. "1000", the caller is awarded a premium.

In the example, if the caller is the thousandth to be transferred, the unit **24** actuates the unit AR1 to produce an announcement; "You have won a $100 credit for your next order. Please stand by."

If the caller is not the one-thousandth to be transferred, as the transfer is wade, the caller is informed: "Sorry, no winner, but here is our operator." Essentially, transferred calls are a subset of callers, involuntarily transferred calls are a sub-subset and winners are still another subset.

Once an operator contact has been established several possibilities exist. One possibility is that the operator completes the contents of the cell register **34** (FIG. **2**) without audio data. Essentially, an operator, active at one of the attended terminals, e.g. terminal AT1 (FIG. **1**) has direct control of the cell register **34** (through the controller **46**, FIG. **2**) along with a data display and may be able to enter digital data manifesting the order. That possibility is indicated by the junction block **130** (FIG. **2**), "digital data complete?"

If the data can be completed without audio record signals, the system operation proceeds to the block **108** (record complete). If the order record is not completed void of audio data, operation proceeds in state "3". Again, under control of a live operator, the system may follow different paths to produce an ultimate determination of whether or not the audio data provides a complete order as indicated by the decision block **134**. In that regard, an operator may perfect an order record on the basis of a bank credit card or a new customer accommodation. In any event, if an order is not completed, the operation simply terminates as indicated by the block **136**. Conversely, a completed order returns operation to block **108** indicating the record is complete.

Exemplary operating patterns of interfaces are treated in detail below; however, after addressing individual caller data, the disclosed embodiment reproduces audio messages at the connected remote terminal. As the interface proceeds, the system cues a remote terminal, as with voice instructions to prompt: (1) digital control signals, (2) digital data signals and (3) audio signals for digital recording. Depending on the control signals, and the format, various patterns are selected with the objective of completing data in the cell register for subsequently processing the individual order. Of course, the processing generally includes data for shipping merchandise and billing the customer.

Consider now a detailed exemplary operation with the attendant operations in the structures of FIGS. **1** and **2** to accomplish the process as illustrated in FIG. **3**. Preliminarily, assume the system is programmed to process orders from XYZ COMPANY for items of merchandise identified to customers as from catalog, newspaper or other advertising. Established customers of the XYZ COMPANY are identified by customer number, telephone number, name and address in the master control and memory unit **24** (FIG. **1**). Assume initially that such a customer actuates the telephone terminal T1 to accomplish an interface through: the communication system CO, one of the audio response units AR1–ARn and the coupler **22** with one of the interface format processors IP1–IPn.

Note that the initial phase of an inbound call may be variously implemented. For example, call signals provided to an audio response unit AR1–ARn may include representations of the caller's number and accordingly access a file on the caller. In accordance with automated number identification equipment designated ANI embodied in the communication facility CO, the caller's number may be provided in a digital form. The master control and memory unit **24** then accesses the caller's cell accordingly to address individual caller data. As described above, the data may be tested before transfer to the cell register **34** with the interface being conditioned on the test. That is, as indicated above, a customer may be limited to a specified number of order calls with regard to a particular catalog or offer. Thus, the interface may involve several tests, one of which is preliminary to setting the addressed customer data in the register **34**. An example will illustrate.

An offering may be made to potential customers regarding goods or services in limited amounts. For example, customers might be offered one or two purchases, but no more. Accordingly, the data cells for such customers would be set to allow only one or two purchases as specified. Specifically, for example, the field **81** (key number) for each potential customer key number would be set at "one". Upon the

occurrence of a call by a customer, an individual associated data cell would be addressed using the caller's telephone number provided by automatic number identification (ANI) equipment. From within the master control and memory unit **24**, the field **81** (key number) of the cell would be checked by the consumable key limit unit **27**. If the consumable key number had been reduced to "zero" or incremented to "one" as programmed to indicate a previous call, the call would be rejected by the active audio response unit AR**1**–ARn. Otherwise, the call would be accepted and the consumable key number would be incremented or decremented by the unit **27**.

With the acceptance of the call, the data cell would be set in a cell register of a selected interface format processor, e.g. processor IP**1**, register **34** (FIG. **2**). The direct interface would then proceed.

Recognizing the various possibilities, assume that at the outset of the direct interface, the voice generator **44** (FIG. **2**, upper left) is actuated by the process controller **46** to greet the caller. For example, the voice generator **44** might cue the caller as follows: "Thank you for calling XYZ COMPANY telephone merchandise service. Please push three buttons on your telephone to identify your first item by catalog number."

Signals representative of three decimal digits identifying an item are supplied from the line **42** (FIG. **2**, upper left) to the multiplexer **52**. As the status register **56** is in the "0" state, the signals pass from the multiplexer **52** through the moving contact **64** and the stationary contact C**1** to be registered in field **82**, "item".

In the illustrative format, the customer next is prompted to digitally enter data indicating choices of color, size, special code and so on. For receiving such data, the gate control **66** actuates the gating network **62** in synchronism with the cue to the second position so that the item data is provided through the contact C**2** to the field **84**. Following a similar pattern, the caller may identify several item designations which are registered in the item fields **82** and **84** of the cell register **34**. Note that items are checked in relation to inventory by the controller **46** acting through the unit **24** (FIG. **1**) and the associated inventory look-up table **25**.

When the caller indicates entry of the last item (as by an interval of silence or a signal) the voice generator **44** is actuated by the controller **46** to complete the interface as predetermined. In one format, the process controller **46** has the caller's telephone number from an ANI communication from the facility CO which addressed the caller's data record. Various information then may be confirmed or supplemented in the register **34**. Note that the system as disclosed is adaptable to accommodate: first-time callers, callers of record and callers with out-dated records. Various payment arrangements for goods or services also are available.

As an alternative, consider a format using a customer's credit card number to access the file. Initially, the operation of the controller is to cue for the method of payment. Specifically, for example, the caller might be cued: "If you wish this order billed to your XYZ COMPANY credit card, please push '1'. Otherwise, push '2'." Accordingly, with a credit card confirmation, the process controller **46** sets the card type in the field **96** advancing the process of FIG. **3** to proceed from the decision block **90**.

Assuming the caller possesses a credit card of XYZ COMPANY, the voice generator **44** (FIG. **2**) states a request (cues) for the number. For example: "Please use your telephone buttons to key in your card number." In synchronism with the cue, the gating network **62** and the status register **56** are set. Accordingly, signals representative of the digits forming the card number are received through the line **42** (FIG. **2**, upper left), the multiplexer **52** and the line L**0** to the gating network **62** (lower left). As the gate control **66** is set by the process controller **46**, the movable contact **64** dwells on the stationary contact C**4**, and the customer's number is stored in the field **98**.

As an alternative to the caller's telephone number for addressing individual data, the customer's number may be utilized, In either event, individual data cells are addressed for record data to load other fields, e.g. fields **150**, **152**, **154**, etc. Generally, if a record for the customer's card is located in the unit **24** (FIG. **1**), the information is returned via the bus **36** (FIG. **2**, right center) and registered in the cell register **34**. Alternatively, the data may be confirmed by the caller and entered through the gating network **62**.

In the disclosed embodiment, the data includes the expiration date of the card placed in field **150**, the is customer's telephone number set in field **152** and the customer's name and address set in the field **154**. The telephone number may be useful if a live interface is prompted or, as indicated above, it may be used as an address to locate a particular file or data.

Considering the stage-by-stage confirming operation, the location of a customer's record prompts the controller **46** (FIG. **2**) to actuate the gate control **66** setting the movable contact **64** to dwell in sequence at the contacts C**5**, C**6** and C**7**. With confirmation, the customer's card expiration date, telephone number and address are supplied to the fields **150**, **152** and **154**. For example, the customer's address is supplied from the controller **46** to the voice generator **44**. Consequently, as indicated above, the caller might be prompted as follows: "According to our records, you are Mr. John Henry with a billing and shipping address of 10 Beverly, Los Angeles, Calif. If our information is correct, please push '1'; if not, please push '2'." This operation is symbolized in FIG. **3** by the block **106** (right center).

Of course, the confirmation of a customer can be broken into even smaller communications if desired. Note that in cueing the caller for confirmation, the status register **56** is set to manifest state "1" indicating that control signals are being cued. Consequently, the response from the caller is passed through the multiplexer to line L**1** and then to the process controller **46**.

If the caller indicates the information is correct, the process controller **46** supplies the address data of record to the field **154**.

If there are no voice fields, the controller **46** actuates the gate control **66** to set the movable contact **64** at the stationary contact C**10**. The operation of completing the record then involves providing an acknowledgement number through the contact C**10** to the field. The acknowledgement number also may be communicated to the caller by the process controller actuating the voice generator **44**. Specifically, an acknowledgement number is set in the field **156** and is vocalized to the caller. Of course, as with other data from storage, it may be confirmed, e.g. "Please repeat your acknowledgement number." Note that callers in a winning or other special set or subset may be identified by coded acknowledgement numbers.

As the final step in the sequence, the movable contact **64** is actuated to engage the stationary contact C**11** through which the process controller **46** supplies a signal indicative of binary "0" manifesting that the order data does not include an audio component, i.e. the voice fields **126** are blank.

With the order complete, the contents of the cell register **34** is transferred through the bus **36** to the master control and memory unit **24**. As indicated above, subsequent processing may involve subsequent operations to: place related calls, fill orders and bill charges. Specifically for example, referring to FIG. **1**, the manually attended terminals AT1–ATn may be actuated to control the processor **33** through the coupling unit **31**. The processor **33** is operated in cooperation with the unit **24** to process individual orders. Note that the audio data stored in cells is flagged for selection as explained in detail below.

To illustrate an alternate course in the process as generally described above, assume that the customer has a valid credit card record with the XYZ COMPANY; however, the address of record is incorrect. In processing an interface with such a customer, the operation would be as described above except that the junction represented by the block **106** (FIG. **3**, right center) would determine an incorrect address. Consequently, with the system in state "1", a control signal manifesting an incorrect address is supplied through the line L1 to the process controller **46** setting up an alternate operation. Specifically, the next step involves determining whether the verification failure may be corrected by a mere change of address as indicated by the block **120** (FIG. **3**). To implement the operation, the process controller **46** (FIG. **2**) actuates the voice generator **44** to cue the caller for control signals. For example, the cue may be stated: "If it is simply a matter of correcting or changing your address, please push '1'. Otherwise, push '2'."

If the caller actuates the "1" button, a control signal is provided through the multiplexer **52** and the line L1 to the process controller **46** indicating a simple address correction. As a result, the process controller **46** sets the status register **56** to state "2" (see block **122**, FIG. **3**). As a consequence, in the system of FIG. **2**, the input path **42** is coupled through the multiplexer **52** to the line L2 for supplying audio signals to the audio signal processor **60**. Note that during this phase of operation, the process controller **46** actuates the gate controller **66** to set the movable contact **64** at the stationary contact C8 or C9 for recording audio data in the voice fields **126**.

In the configuration as described, on cue, the oral statement of the caller's address is provided as an analog signal which may be variously transmitted through the communication facility CO (FIG. **1**) to ultimately reach the line **38** (path **42**) (FIG. **2**, upper left). From the path **42**, the representative analog signal is supplied through the multiplexer **52** and the line L2 to the audio signal processor **60** which may variously process the data and encodes the analog signals in a digital format. Accordingly, digital signals indicative of the caller's correct address are registered in the fields **126** of the cell register **34**.

With the proper address stored, the customer's record is complete in the cell register **34** and the process proceeds to the operations represented by block **108** (FIG. **3**, right center). Specifically, an acknowledgement number is revealed and stored in the field **156** of the cell register **34**. As audio signals are involved, the field **112** registers a binary "1" indicative of that class of data cell (audio).

Note that data words stored in the cell register **34** may be variously segregated or processed based on their classification as registered in the field **112**. For example, it may be desirable to segregate class "1" and class "0" orders for distinct off-line processing. In that regard, as class "0" orders have no audio data, they involve somewhat simpler process operations in that no human action is involved. Conversely, class "1" orders in the disclosed system are contemplated to involve human processing to convert spoken words to digital data.

To pursue another possible course of operation, assume that prompting or cueing a customer regarding his altered address does not involve a mere change. That is, assume the decision block **120** (FIG. **3**, central) produced a control signal manifesting "no", i.e. more than a mere change is involved and a live contact interface is desirable. Upon such an occurrence, state "3" is set as indicated by the block **118** (FIG. **3**). As indicated above, several other possibilities may set the operation of state "3". In any event, the status register **56** (FIG. **2**) is set by the controller **46** to manifest state "3" . Consequently, the status register **56** controls the multiplexer **52** actuating communication through the line L3 to the lines **48** and **50** coupled to one of the attended terminals AT1–ATn (FIG. **1**).

In the configuration of state "3", the process controller **46** along with the lines **48** and **50** are linked to one of the attended terminals AT1–ATn enabling an operator to speak directly with a caller and concurrently set data into the data cell register **34** through the controller **46**. Note that the attended terminals AT1–ATn include a display and, accordingly, the controller **46** cooperatively drives the display with the cell register to indicate the state of the interface and the caller's data. Thus, unconventional orders are processed with the system in state "3" as described above, the process flowing from the block **118** (FIG. **3**, upper left).

Of course, numerous possibilities exist for completing an order with an attended terminal. In that regard, the contents and control of the cell register **34** is by the attended terminal and the problem may simply be one of communication in which case the order data may be completed either with or without audio data.

Recapitulating to some extent, a live interface is prompted from several situations. One case involves the caller depressing the "*" button. Also, if the caller does not have credit with the XYZ COMPANY (not a local account) a live interface is prompted. In that regard, an alternative credit card as a bank card may be employed. Accordingly, data is received in either an audio or non-audio form.

Consider a bank credit card order with reference to FIG. **2** in which the cell register **34** receives alternate information. In this situation, the field **96** may store an indication of an acceptable bank card. Specifically, fields **96**, **98** and **150** respectively store a bank card type, the bank card number and the expiration date. It may be further advisable to store the caller's telephone number in field **152**. The caller's name and address will be stored; and in that regard, either the field **154** may be utilized by the operator at an attended terminal or an audio record may be keyed for storage in one or more fields **126**. If the order is completed by an operator, the system proceeds as explained above with the final steps of indicating an acknowledgement number and designating the class of the order. Thereafter, as in other examples, the contents of the cell register is returned to the master control and memory unit **24** (FIG. **1**) for subsequent processing. Note, class "1" orders also may be stored, as in a processor IP1–IPn until completed (without audio data).

It may be seen that the system accomplishes telephonic interfaces utilizing various operations in accordance with control signals prompted by cues from a voice generator. That is, the system alternately may cue a caller to provide: digital data, control data or audio data. Concurrent with the cueing operations, the system assumes a state for compatibly processing responses. Specifically, if control signals are

cued, the system is controlled accordingly. If data signals are cued, the system registers such data in either an audio or non-audio format. Furthermore, depending upon the detailed operation of the system, order data is developed as in individual cells for subsequent off-line processing. Individual packets or cells of such data are classified as disclosed above, and such classifications may be effectively utilized to segregate or perform various other processing operations.

In view of the above description, it will be apparent that the system of the present invention may be effectively used in telephonic interfaces to accommodate flexibility and control by a caller. Although the disclosed embodiment is directed to a sales operation, it will be apparent that the system may be variously embodied to accommodate any of a variety of telephonic interface operations, e.g. poll, game format, information service and so on. Furthermore, it will be apparent that while the disclosed embodiment comprises specific elements and configurations, any of a variety of structure might well be utilized. Accordingly, the scope hereof is deemed to be as set forth in the claims below.

What is claimed is:

1. A method for controlling voice or data or both types of communications for use with a communication facility including remote terminals for individual callers, wherein said remote terminals include a digital input device for providing digital responsive signals, said method comprising the steps of:

receiving caller number identification signals indicative of at least a portion of a caller's number from said communication facility;

cuing select ones of said remote terminals to prompt selective actuation by individual callers of said digital input device to provide responsive signals;

selectively identifying said responsive signals from said select ones of said remote terminals as digital data signals or digital control signals, wherein certain of said responsive signals can serve as digital data signals, digital control signals, or both, said responsive signals including signals indicative of a customer identification number for an individual caller that may be utilized to access a file for said individual caller;

testing at least a portion of said customer identification number for approval;

recording said caller number identification signals provided from said communication facility as additional data for said individual caller;

transferring a call from said individual caller to an attended terminal and displaying at least a portion of data stored in said file to an operator at said attended terminal under control of said responsive signals indicative of said customer identification number and displaying at least a portion of the customer identification number wherein the operator at said attended terminal is capable of entering data to facilitate completion of the call from said individual caller; and

automatically providing a connection with another one of said remote terminals in accordance with stored telephone numbers.

2. A method as defined in claim **1**, further comprising the step qualifying callers with respect to limited use.

3. A method as defined in claim **1**, further comprising the steps of:

providing a plurality of format configurations, and selecting one from said plurality of format configurations.

4. A method as defined in claim **1**, further comprising the step of:

recognizing first time caller.

5. A method as defined in claim **4**, further comprising the step of:

upon recognizing the first time caller, transferring said first time caller to the attended terminal.

6. A method as defined in claim **5**, further comprising the step of:

testing said caller number identification signals to identify said first time caller prior to transferring said first time caller to said attended terminal.

7. A method according to claim **1**, further comprising the step of:

receiving caller credit card number data signals as certain of said responsive signals.

8. A method according to claim **7**, wherein said receiving step also includes receiving credit card expiration date data signals as certain of said responsive signals.

9. A method according to claim **8**, wherein the credit card number data signal and the credit card expiration date data signals are verified.

10. A method according to claim **7**, wherein the caller credit card number signals are verified.

11. A method according to claim **7**, wherein for billing purposes said caller credit card number data signals are indicative of said customer identification number.

12. A method according to claim **11**, wherein said caller credit card number data signals are tested for approval.

13. A method according to claim **12**, wherein said caller credit card number data signals are tested for limited use.

14. A method according to claim **1**, wherein access to said file for said individual caller is controlled at least in part by said caller number identification signals.

15. A method according to claim **1**, wherein said data entered by said operator includes data provided by said individual caller.

16. A method according to claim **1**, wherein said customer identification number is the same as said at least a portion of said caller's number.

17. A method as defined in claim **7**, further comprising the step of:

recognizing a first time caller.

18. A method as defined in claim **17**, further comprising the step of:

upon recognizing said first time caller, transferring said first time caller to the attended terminal.

19. A method as defined in claim **1**, wherein said caller number identification signals control processing of at least certain of said digital data signals.

20. A method according to claim **1** wherein said remote terminals include a voice communication device for providing audio responsive signals, and said method further comprises the steps of:

selectively identifying said responsive signals as digital data signals, digital control signals, or audio signals; and

recording said audio signals in digital format.

21. A method according to claim **20**, further comprising the step of:

reproducing recorded audio signals as caller voice data at a remote terminal.

22. A method according to claim **20**, further comprising the step of:

subsequently processing recorded audio signals.

23. A method according to claim 1 wherein said certain of said data stored in said file for said individual caller includes address data.

24. A method according to claim 1, further comprising the step of:

displaying caller name data at the attended terminal.

25. A method according to claim 1, further comprising the step of:

displaying caller address data at the attended terminal.

26. A method according to claim 1, further comprising the step of:

displaying caller telephone number data at the attended terminal.

27. A method according to claim 1, wherein in the testing step, said customer identification number is tested against the file including negative file data.

28. A method according to claim 1, wherein the responsive signals further include an additional form of caller identification data.

29. A method according to claim 28 wherein the additional form of caller identification data is a caller credit card number.

30. A method according to claim 28 wherein the additional form of caller identification data is a caller customer number data.

31. A method for controlling voice or data or both types of communications for use with a communication facility including remote terminals for individual callers, wherein said remote terminals include a digital input device for providing digital responsive signals, said method comprising the steps of:

receiving caller number identification signals indicative of at least a portion of a caller's number from said communication facility;

cuing select ones of said remote terminals to prompt selective actuation by an individual caller of said digital input device to provide responsive signals;

selectively identifying said responsive signals from said select ones of said remote terminals as digital data signals or digital control signals, wherein certain of said responsive signals can serve as digital data signals, digital control signals, or both, said responsive signals including signals indicative of a customer identification number for the individual caller that may be utilized to access a file for said individual caller; testing at least a portion of said customer identification number for approval;

recording said caller number identification signals from said communication facility as additional data for said individual caller;

transferring a call from said individual caller to an attended terminal and displaying at least a portion of data stored in said file to an operator at said attended terminal under control of said responsive signals indicative of said customer identification number and displaying at least a portion of the customer identification number wherein the operator at said attended terminal is capable of entering data to facilitate completion of the call from said individual caller; and

generating computer acknowledgement numbers to identify the transaction for the system and individual callers and providing said computer acknowledgement numbers to the individual callers.

32. A method according to claim 31, wherein the transaction is an order transaction.

33. A method according to claim 32, wherein the order transaction relates to a mail order.

34. A method for controlling voice-data communications with a system operating a format for use with a communication facility including remote terminals for use by certain individual callers, wherein said remote terminals include a digital input device for providing digital responsive signals, said method comprising the steps of:

interfacing said certain individual callers with an interface unit of said system operating the format;

prompting said individual callers via a voice generator to provide responsive signals representative of identification data via said digital input device of said remote terminals;

receiving from said individual callers responsive signals representative of caller identification data;

comparing said caller identification data received against a file on said individual callers to determine if said caller identification data received is already of record;

utilizing said caller identification data received to access the file to locate other data associated with said caller identification data;

transferring at least certain of said individual callers to an attended terminal;

displaying at said attended terminal at least a portion of the other data associated with the caller identification data; and

providing computer generated acknowledgement numbers to said individual callers to identify transactions to the individual callers and the system.

35. A method according to claim 34, wherein said, caller identification data provided by said individual caller includes customer number data.

36. A method according to claim 34, further comprising the step of:

selecting the format from a multiple configuration of formats.

37. A method according to claim 34, wherein the displaying step includes:

displaying at least a portion of the data entered by said individual callers and stored during an instant call.

38. A method according to claim 34, wherein the displaying step includes:

displaying at least a portion of the data stored prior to an instant call.

39. A method according to claim 34, wherein the displaying step includes:

displaying at least a portion of the data stored prior to the instant call and at least a portion of the data entered by the callers during the instant call.

40. A method according to claim 34 wherein the responsive signals provided by the individual callers include credit card number data and credit card expiration date data and both are verified.

41. A method according to claim 34, wherein the data displayed includes caller order data.

42. A method according to claim 41 wherein the caller order data displayed is entered during the instant call.

43. A method according to claim 34, wherein the data displayed includes caller telephone number data.

44. A method according to claim 43 wherein the caller order data displayed relates to previously stored data.

45. A method according to claim 44 wherein the previously stored data includes caller credit card data which is further displayed.

46. A method according to claim 44 wherein the previously stored data includes expiration date data which is further displayed.

47. A method according to claim 34, wherein the caller identification data is a caller's bank credit card number.

48. A method according to claim 34 wherein said caller identification data is compared against the file including negative file data.

49. A method according to claim 34 wherein the responsive signals provided by the individual callers include caller card number data.

50. A method according to claim 34, wherein the responsive signals provided by the individual callers include credit card expiration date data.

51. A method according to claim 34, wherein said other data displayed includes caller name data.

52. A method according to claim 51 wherein the data displayed further includes caller address data.

53. A method according to claim 51 wherein additional data relating to the call is order data.

54. A method according to claim 53 wherein the order data includes item number data.

55. A method according to claim 54 wherein the individual callers further provide data relating to the item number.

56. A method according to claim 55 wherein the further data relates to a color of the item.

57. A method for controlling voice-data communications with a system operating a format for use with a communication facility including remote terminals for use by certain individual callers, wherein said remote terminals include a digital input device for providing digital responsive signals, said method comprising the steps of:

interfacing said certain individual callers with an interface unit of said system operating the format;

prompting said individual callers via a voice generator to provide responsive signals representative of identification data via said digital input device of said remote terminals;

receiving from said individual callers responsive signals representative of caller identification data and order data provided as additional data relating to the call including data indicative of an item and further data relating to the item number, wherein the further data relates to a size of the item;

comparing said caller identification data received against a file on said individual callers to determine if said caller identification data received is already of record;

utilizing said caller identification data received to access the file to locate other data associated wit said caller identification data;

transferring at least certain of said individual callers to an attended terminal;

displaying at said attended terminal at least a portion of the other data associated with the caller identification data, wherein said other data displayed includes caller name data; and

providing computer generated acknowledgement numbers to said individual callers to identify transactions to the individual callers and the system.

58. A method for controlling voice-data communications with a system operating a format for use with a communication facility including remote terminals for use by certain individual callers, wherein said remote terminals include a digital input device for providing digital responsive signals, said method comprising the steps of:

interfacing said certain individual callers with an interface unit of said system operating the format;

prompting said individual callers via a voice generator to provide responsive signals representative of identification data via said digital input device of said remote terminals;

receiving from said individual callers responsive signals representative of caller identification data;

comparing said caller identification data received against a file on said individual callers to determine if said caller identification data received is already of record;

utilizing said caller identification data received to access the file to locate other data associated with said caller identification data;

transferring at least certain of said individual callers to an attended terminal;

displaying at said attended terminal at least a portion of the other data associated with the caller identification data; and

providing computer generated acknowledgement numbers to said individual callers.

59. A method for controlling voice-data communications with a system operating a format for use with a communication facility including remote terminals for use by certain individual callers, wherein said remote terminals include a digital input device for providing digital responsive signals, said method comprising the steps of:

interfacing said certain individual callers with an interface unit of said system operating the format;

prompting said individual callers via a voice generator to provide responsive signals representative of identification data via said digital input device of said remote terminals;

receiving from said individual callers responsive signals representative of caller identification data;

comparing said caller identification data received against a file on said individual callers to determine if said caller identification data received is already of record;

utilizing said caller identification data received to access the file to locate other data associated with said caller identification data;

transferring at least certain of said individual callers to an attended terminal;

displaying at said attended terminal at least a portion of the other data associated with the caller identification data;

generating with a computer and providing acknowledgement numbers to said individual callers to identify transactions to the individual callers and the system; and

wherein the acknowledgement numbers are provided to the individual callers as confirmation data relating to transactions.

60. A method for controlling voice-data communications with a system operating a format for use with a communication facility including remote terminals for use by certain individual callers, wherein said remote terminals include a digital input device for providing digital responsive signals, said method comprising the steps of:

interfacing said certain individual callers with an interface unit of said system operating the format;

prompting said individual callers via a voice generator to provide responsive signals representative of identification data via said digital input device of said remote terminals;

receiving from said individual callers responsive signals representative of caller identification data;

comparing said caller identification data received against a file on said individual callers to determine if said caller identification data received is already of record;

utilizing said caller identification data received to access the file to locate other data associated with said caller identification data;

transferring at least certain of said individual callers to an attended terminal;

displaying at said attended terminal at least a portion of the other data associated with the caller identification data;

providing computer generated acknowledgement numbers to said individual callers and wherein the computer generated acknowledgement numbers are provided to the individual callers as confirmation data relating to transactions.

61. A method for controlling voice-data communications for use with a communication facility including remote terminals for individual callers, wherein said remote terminals include a digital input device for providing digital responsive signals, said method comprising the steps of:

cuing select ones of said remote terminals via a voice generator to prompt selective actuation by callers of said digital input device to provide responsive signals;

receiving said responsive signals including signals indicative of a customer identification number for an individual caller that may be utilized to access a file for said individual caller or receiving said responsive signals including signals indicative of other data;

testing at least a portion of said customer identification number for approval;

processing the other data for the individual caller utilizing multiple comparative operations;

confirming with said individual caller, via the voice generator, certain of said data stored in said file for said individual caller; and

transferring a call from said individual caller to an attended terminal and displaying at least a portion of data stored in said file at said attended terminal under control of said responsive signals indicative of said customer identification number wherein said attended terminal has a capability for data to be entered to facilitate completion of the call from said individual caller.

62. A method according to claim **61** further comprising the step of:

receiving caller number identification signals indicative of at least a portion of a caller's number from said communication facility.

63. A method according to claim **62** further comprising the step of:

utilizing the caller number identification signals as additional data for the individual caller.

64. A method according to **61**, wherein at least a part of the data stored in the file is audio data.

65. A method according to claim **64** wherein the audio data is at least in part utilized to accomplish at least part of the confirming step via an audio response unit.

66. A method according to claim **61** wherein at least part of the data stored in the file is caller address data.

67. A method according to claim **61** wherein at least part of the data stored in the file is caller name data.

68. A method for controlling voice-data communications for use with a communication facility including remote terminals for individual callers, wherein said remote terminals include a digital input device for providing digital responsive signals, said method comprising the steps of:

receiving a call from said individual caller at an automated system for controlling the voice-data communications with said individual caller and receiving data entered by said individual caller;

testing said data entered by said individual caller against a file of negative file data;

prompting said individual caller via a voice generator with stored data from a database of stored data for said individual caller;

also subsequently testing for acceptable credit transactions;

transferring a call from said individual caller to an attended terminal and transferring and displaying at least a portion of the data entered by said individual caller; and

displaying at the attended terminal, at least a portion of the data entered by said individual caller as well as at least a portion of the data stored in said database.

69. A method according to claim **68**, wherein said test for acceptable transactions includes a test for a valid credit card number provided by said individual caller.

70. A method according to claim **68**, wherein said test for acceptable transactions includes a test of expiration date data.

71. A method according to claim **68**, wherein said prompting step prompts said individual caller for address data.

72. A method according to claim **68**, wherein said prompting step prompts said individual caller for data related to a stored credit card number.

73. A method according to claim **68**, wherein said prompting step prompts said individual caller for data indicating a name of the credit card.

74. A method according to claim **68**, wherein display at the attended terminal includes credit card number data for said individual caller.

75. A method according to claim **68**, wherein the display at the attended terminal includes expiration date data for said individual caller.

76. A method according to claim **68**, wherein the display at the attended terminal includes shipping address data for said individual caller.

77. A method according to claim **68**, wherein the data stored in said database includes voice data.

78. A method according to claim **68**, further comprising the step of:

generating and providing acknowledgement numbers to said individual callers.

79. A method according to claim **68** wherein the acknowledgement numbers are provided to callers as confirmation data relating to transactions.

80. A method for controlling audio-digital data communications for use with a communication facility including remote terminal for individual callers, wherein said remote terminals include an audio device for providing audio responsive signals and a digital input device for providing digital responsive signals, said method comprising the steps of:

receiving calls from select remote terminals and caller number identification signals relating to the remote terminals that are automatically provided by the communication facility;

testing the caller number identification signals against stored calling number identification signals to ensure their validity;

prompting the individual callers via a voice generator to provide responsive signals;

receiving personal identification data entered by the individual callers via the digital input device;

verifying the personal identification data entered by the individual callers before they are allowed further audio-digital data communication;

storing the audio responsive signals and the digital responsive signals provided by the individual callers; and

subsequently processing after calls are terminated either stored audio responsive signals or both the stored audio responsive signals and stored digital responsive signals after testing the caller number identification signals and the personal identification data.

81. A method according to claim **80** wherein only the stored audio responsive signals are utilized for subsequent processing by transmission of the stored audio responsive signals to a remote terminal.

82. A method according to claim **80** wherein both the stored audio and the stored digital signals are utilized for subsequent processing by transmission of the stored audio and the stored digital signals to a remote terminal.

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